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Maus, HMS 'Invincible', Mulberry Harbour, US
Army uniforms**

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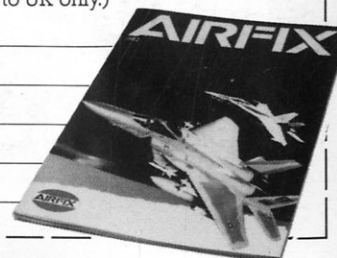
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Volume 23 No 11

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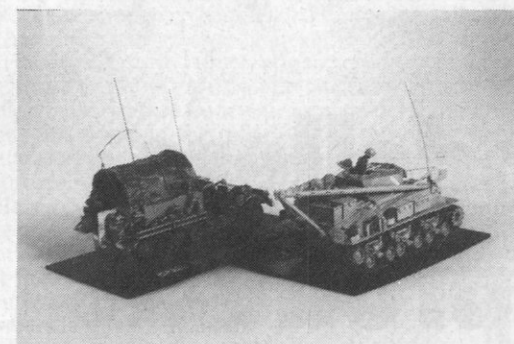
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A photograph of the Israeli M32 ARV as built by Tim Neate. For more information on how he did it, turn to page 524 and see what can be achieved by a bit of patience and hard work.

On the cover

A Chipmunk patrols over the city of Berlin as part of the RAF's responsibility to make British influence known and felt. In the distance the city's Tempelhof airport can be seen. Chipmunks are kept at RAF Gatow where the communist border runs next to the perimeter of the air terminal. For more information and pictures, turn to page 508.

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Editor's Notebook

No-body glorifies in warfare and the inevitable bloodshed which accompanies it, least of all us and the manufacturers of plastic kits. This may sound an anomaly in some ways because this magazine, (among others), devotes much of its content to aspects of warfare and the 'ironmongery' and other equipment which goes with it. Many kits and models on the market are of weapons of war with a lot of toy and hobby manufacturers in the business of making accurate replicas of weapons and equipment of all sorts. Our readers share in the common interest by making and converting the models. For there is a fascination in the technology of it all and the influence of events on the way weapons and fighting techniques develop. But, I repeat, I've never come across a serious modeller who actually glories in the thought of warfare and slaughter. This is not to say we don't find events and weapons interesting and worthy of study, for that is where the magazines and the manufacturers of kits meet the modeller on common ground. As these words are written the Falkland Islands crisis is unfolding, let us hope to a satisfactory conclusion. On the world scene it caught the British government, and others, somewhat wrong-footed, so that much effort had to be expended by the defence forces in the mighty quest to muster a Task Force and the other means of carrying a military response to events in the South Atlantic.

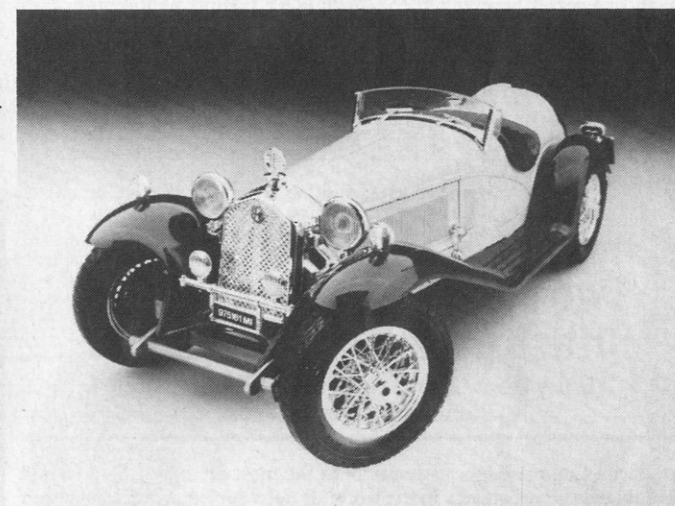
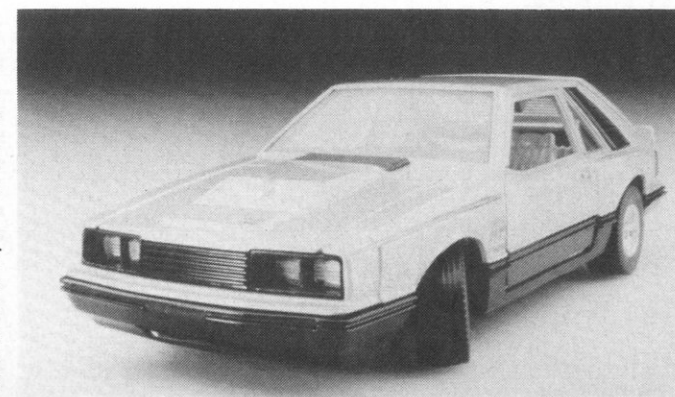
Though in a far different and more flippant league to these grave matters, I could not help reflecting how these recent developments have also caught the kit market unawares as well. Most of the equipment being used by both sides is elderly, so we are not talking about being very up to the minute. But where are the kits or models of *Invincible*, *Hermes*, a Type 42, a Vulcan bomber, or even a Super Etendard? If the events interested you enough to want to model aspects of the campaign — the Task Force at sea, a Vulcan operating from Ascension, or whatever, you would be hard put to do it. True, a Sea Harrier has made a timely appearance from Matchbox, but not many other items of equipment currently in the news can be purchased in miniature from your local model shop! Presumably we can put this down to the inflation and the rocky state of the kit manufacturers in recent years which caused them to cut back on their programmes or become ultra-cautious in their approach to new models. For example Airfix produced what was up-to-the-minute in the fleet of the 1960s (eg, *Victorious*, *Fearless*) but with one or two exceptions they never followed this in the 1970s or 1980s. Who can doubt that if a 1:600 or 1:700 scale kit of *Invincible* or *Hermes* was currently available they would not be selling in thousands just now? Likewise the Super Etendard?

In the matter of the over-cautious approach, however, I happen to know that the Airfix company of a few years ago had many suggestions for a Vulcan but they would never commit themselves, despite considering it many times. Somewhere along the line the adventurous spirit seems to have disappeared (perhaps with the profits) in several kit companies. The Space Shuttle seems to be the last time several kit makers managed to keep abreast of events with a quick reaction. The present gloomy lack of models of equipment in the news is rather like keen modellers of yesteryear not being able to buy balsa models of Spitfires, Hurricanes, and Messerschmitts in 1940! Perhaps I'm premature in my views and the coming months will see kits appear, but with today's long lead times and high costs I rather doubt it.

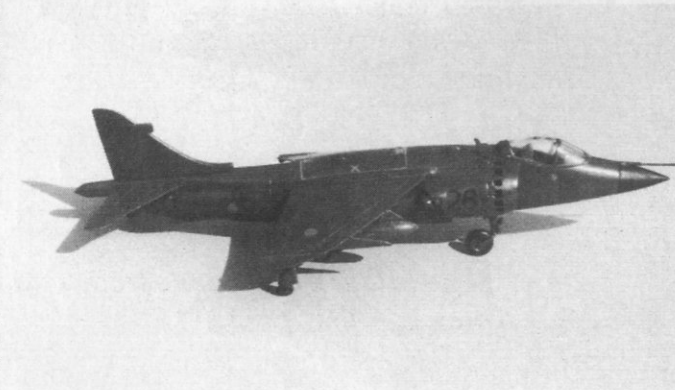
We were wrong-footed, too, because our 'farewell' article on the Vulcan was printed the day before they were reprieved for the Falklands crisis, as readers will no doubt have perceived! I must apologise to the author and readers for a mix-up on the captions due to loss of pictures at the printers. The top picture on page 431 (May) actually showed the Avro 698 prototype VX 770 and the picture below it showed B1 XM649. The aircraft on the cover was not a 74 Sqn machine. Sorry about these errors.

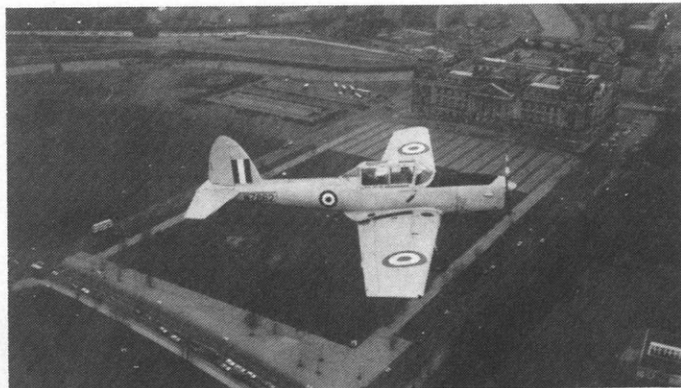
Chris Ellis

Aircraft very much in the news in the South Atlantic was the Sea Harrier. We painted the new Matchbox model in the 'sea blue' colours applied to FAA Sea Harriers during the campaign. Note B type roundels. Blue was from Humbrol BR Blue with a little added white. A special article on the Falklands will appear in the next issue, plus a Sea Harrier review.



Readers may be interested in these new releases from Einco. Top shows the Burago Mercury Capri RS in 1:24 scale, which amongst its many other attractions has steerable wheels and tipping seats. Centre is the beautiful Burago Alfa Romeo 2300 Spider RSP in 1:18 scale. The model comes in cream and royal blue at £11.65. Above is the Burago 0188 Cheetah Tiger in 1:24 scale. The model is part of the company's new Blitz range and is particularly attractive to children. For extra information on some of these kits, turn to our New Kits section on page 546.





Royal Air Force Chipmunk WZ682 from RAF Gatow, photographed on routine patrol over Berlin. In the background is the famous Reichstag building. All marking positions are well shown here.

Chipmunks in Berlin

Two elderly Mk 10s keep the British presence very visible

Story from Colin Tredwell, RAF Germany
Pictures by Barry Ellison

The Berlin Control Zone, without doubt the most accurately defined and carefully policed urban area in the world, is not a subject which lends itself easily to humour. And yet it has its incongruous side. The story is told of a characteristically testy remark by Britain's legendary wartime commander Field Marshall Sir Bernard Montgomery, during the allied talks in Berlin at the end of the war to settle the city's future. All parties agreed that the council zone should extend for 20 miles from the Berlin Air Safety Centre, but immediately the question was raised: 'What sort of miles?'

'British miles, of course' snapped Monty — and to this day, in a metric world of kilometres and metres, the Berlin Control Zone remains defined as that area within a 20 statute mile radius of the centre.

Today the British influence is maintained in Berlin along with the Americans, French and Russians in their respective sectors of the city, and the Royal Air Force has the job of maintaining a visible presence in the agreed air space over the city. To do the job, the RAF uses the oldest aircraft

Squadron Leader Mike Neil, Officer Commanding the Chipmunk Flight at RAF Gatow, prepares for take-off. It could almost be World War 2 with a scene like this. There is a yellow edge with red 'ticks' on the wing walkway. Note the gloss finish of the paint, visible on the cowling, and the German fire extinguisher wording.



design remaining in air force service — Chipmunk T 10 aircraft designed by de Havilland of Canada in the closing years of the war, and which entered RAF service in 1948.

A flight of two Chipmunks is kept at RAF Gatow, the air terminal for the British sector whose perimeter road runs within yards of the communist border. The two aircraft regularly patrol over all sectors of the great city, showing the flag and simply exercising the right to do so.

In command of the flight is Squadron Leader Mike Neil, 47, who confesses nostalgia for the years when he flew Vampire and Venom jet aircraft, but nevertheless enjoys the Chipmunks enormously. The sound of the old Gipsy Major Mk 8 engine, and the bright paintwork are certainly unmistakable — and for the foreseeable future the aircraft are likely to remain the ideal tool for the job.

What is of special interest to modellers and aircraft enthusiasts is that in an



Top: Squadron Leader Mike Neil checks flight details with Senior Aircraftwoman Elaine Fraser before taking off on a routine patrol in one of RAF Gatow's two Chipmunk aircraft. Above: Corporal Alan Duncan, airframe fitter, checks the Chipmunk's controls before a sortie over Berlin. This is the flight's second aircraft.

age of camouflage and low visibility markings, the old Chipmunks, nearest to the 'front line' in Europe of all RAF aircraft, are deliberately kept in light colours and D type markings to advertise their presence. Though they may appear silver or bare metal in 1950s style, the aircraft are actually in light aircraft grey as a basic overall colour. The Airfix Chipmunk could be painted up very easily to depict one of these Berlin Chipmunks.

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HMS INVINCIBLE

With the Falklands Crisis having bought the Royal Navy once again into the forefront of the public's gaze, it is not surprising that a large proportion of the attention is focused on the modern ASW Carriers, HMS *Invincible*. Aside from the fact that she has on board a member of the Royal Family as one of her ASW Helicopter aircrews, and members of the Press, (factors which automatically assure her prom-

inent press coverage), she will also be closely followed by those with a more technical interest in her attributes, such as the Royal Australian Navy, and indeed, the Communist Bloc Navies.

Looking back on the history of *Invincible*, it is surprising that she does in fact exist at all as defence policies are always changing according to the political and economic climate of the day, causing the future of

various ships to always remain uncertain.

The story really starts back in 1965, when under the Wilson/Healey government defence cuts, the replacement Aircraft Carrier for the late *Ark Royal*, namely project CVA-01, was cancelled. Readers will no doubt recall that amongst the other defence projects which were cancelled around that time, were the 'TSR2', the Supersonic version of the Harrier, and

Andrew Ambrose models the ship in 1:600 scale

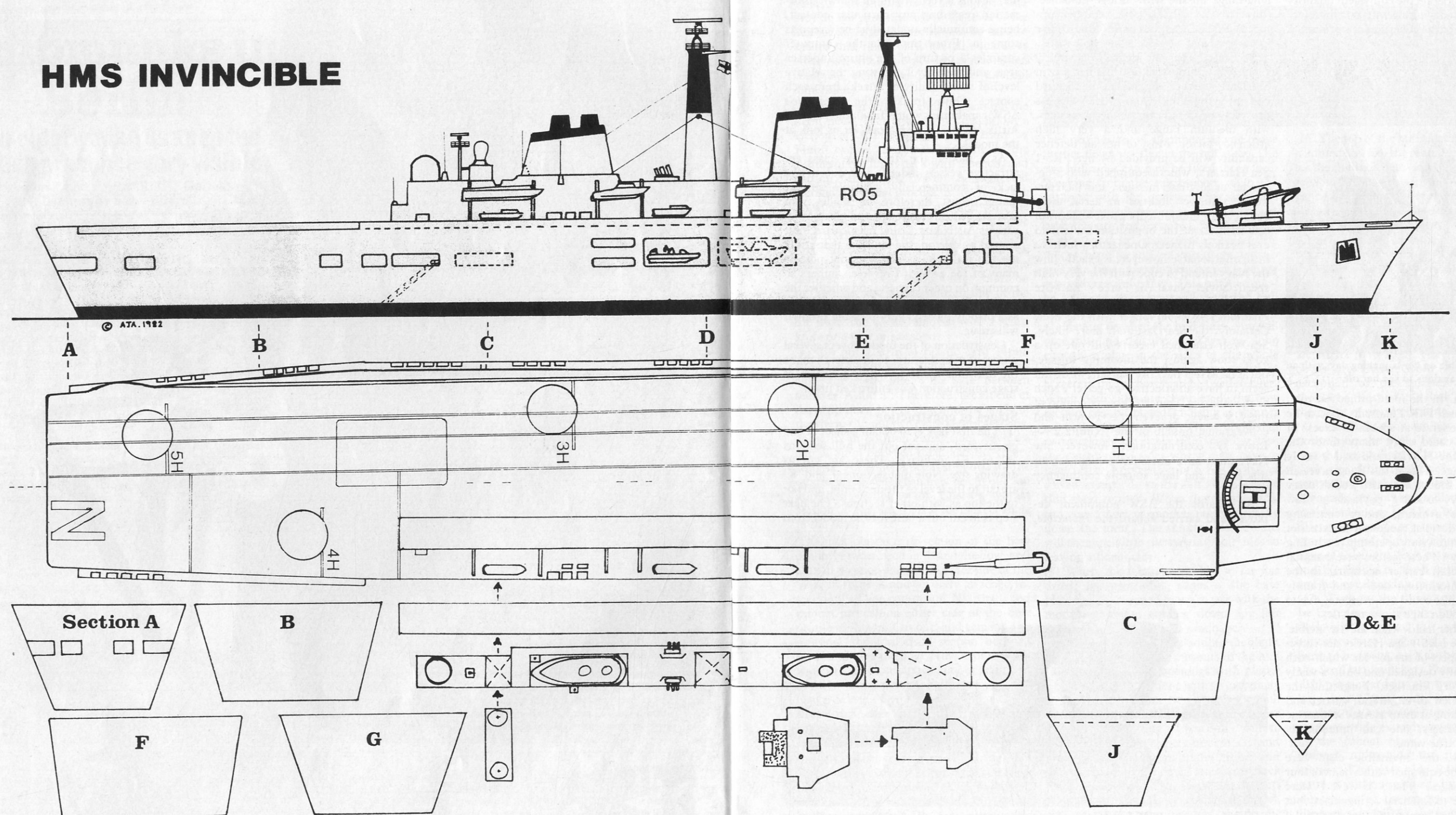
numerous other items, including the development of a British 'ship to ship' missile, (presumably so that Britain could buy these items from abroad at much increased cost). Is it not strange that the same Mr Dennis Healey who savagely annihilated Britain's defences in the sixties, appeared on television to say how disgusted he was with the way that the Falkland Crisis had been handled to date.

Invincible was laid down on 20 June 1973 at Vickers Shipyard at Barrow, in order to attempt in a small way, to cover the gap left in the fleet when the conventional carriers were retired. Initially, *Invincible* was to be followed by a further two ASW Cruisers of similar type, one of which was due to have been laid down soon after the first, at Swan Hunters, Wallsend, to be followed by a third whose keel was to have been laid

directly after the launch of the first at Barrow. However, those plans did not come into being until 1978, (over a year after the launch of the first hull) when the third was eventually ordered.

These three new carriers, which became the *Invincible*, *Illustrious*, and *Ark Royal*, were a complete concept away from earlier aircraft carriers in that they had little value in long range force projection, and as such

HMS INVINCIBLE



were principally not designed to undertake that role anyway. The task for which they were originally designed, was as an ASW equipment platform, capable also of operating a limited number of Harrier aircraft in order to give the fleet some intrinsic measure of airborne interception ability. It was a widely held belief at the time by certain politicians, that the Royal Air Force would be capable of providing the entire fleet with effective air cover, but in fact no Royal Air Force aircraft type had the required range capability, which has in recent days become only too apparent.

As an aircraft carrier, the 'Invincible' class was therefore not comparable with even the old *Ark Royal* (deceased 1980), as it could not operate the equivalent quantity or type of fixed wing aircraft, and therefore fell far short of the government's presumed



HMS Invincible on her launching day, with an eager crowd anxious to see her off.

expectations. In the force projection role, the McDonnell F4K Phantoms aboard the *Ark*, could operate at speeds in excess of 1600 mph, could carry many times the payload of the Harrier, and had a vastly superior range. Whilst the Buccaneer, an immensely robust aircraft, could carry comparatively massive payloads at low level, hence avoiding and/or confusing radars, and do so at ranges far in excess of any naval aircraft now operating (excluding the US Navy). These factors were essential for any aircraft carrier operating in the projection/interdiction tasks, and frankly the Harrier just could not compete, due to its low payload/range characteristics.

On the other hand, when the 'Invincible' class and the FRS-1 Sea-Harrier are considered in respect of the job for which both were originally designed and built, a vastly different story emerges. Forgetting the traditional view of an aircraft carrier and instead, looking at them as Anti Submarine Warfare Carriers, one can immediately realise their true value.

Originally, the 'Invincible' class were destined to be equipped with a bank of four Exocet missiles. These however, were omitted due to financial stringencies, but even if they had been fitted, it is doubtful if they would have been of any use as their

range was very short — only 23 miles. Most Soviet vessels which the carrier might have to deal with, possess missiles of far greater range, and so would not need to approach the carrier to sink it, and as a result, in order for the carrier to engage in surface action, she would need to be the hunter and try and get the hostile unit within the range of her Exocets. This simply is not the role of a carrier as it puts a large and costly vessel at too much of a risk, and so policy appeared to favour the use of escort vessels and aircraft to take over all SSM (surface to surface) duties of these ships. Another rumour which circulated in the late 70's was that a long range tactical cruise missile such as the US Navy's 'Tomahawk', or a long-range missile with 'bridge guidance' (directed by a suitably positioned helicopter) would be fitted, but none of these have as yet appeared, if indeed they ever will.

As regards her air defence capability *Invincible* is fairly well off. She has a twin Sea-Dart launcher mounted at the forward end of the flight deck, and in trials this has proved to be an extremely effective system, with medium range and a very high efficiency factor. Most of her air defence capability will be provided by her FRS-1 Sea Harriers, which, equipped with side-winder or Skyflash missiles, and the Harriers 'exclusive' abilities in aerial manoeuvre, will undoubtedly prove successful against most of the opposition she would ever be likely to meet. One factor which is a little questionable however, is exactly how the Navy intend to cope with the very high speed, Soviet Naval Air Force's 'Backfire B' with its stand off missiles, now that the Phantom F4K is no longer with the fleet. Certainly, the Sea-Dart and, more likely, Sea-Wolf equipped escorts will put up a good show against the incoming missile, but as far as the 'Backfire' herself, we do not seem to have an effective 'go-getter', such as the amazing Tomcat-Phoenix combo of the US Navy; or even the Tomcat and conventional missile of the 'Nimitz 2 — Libya O' confrontation. However, the Navy must have obviously thought about this point, and have suitable contingency plans.

As regards the ASW equipment deployed and carried aboard the *Invincible*,

she is probably the finest anti-submarine vessel in existence as the technology incorporated in her is vastly superior to the usual run of the mill ASW fits.

For sensors she mainly uses her helicopters, as her hull set/sets are limited by the turbulence created by her speed. Her computer is really sophisticated, in that it receives, collates, updates, stores and projects, not only the information received from her Sea-King ASW helicopters, but also, information gained from all friendly sources; be they Hydrophone arrays laid on the ocean beds, maritime recce and AEW aircraft such as the Nimrods, or any other source in her operations zone. All this information is collated, and displayed on her various screens, with all known information regarding any particular contact, being continually updated as new reports come in. From this data the computer compiles a picture of the entire undersea area, and presents it, showing the relative level of vulnerability of attack, from each contact. Quite frankly, the *Invincible's* ASW capabilities would fill all the pages of *Airfix Magazine*, so instead, let us look at the model.

As a model, the 'Invincible' class are attractive vessels indeed, and due to the lack of commercially available subject matter, must therefore be made from scratch, utilizing spare bits and pieces from various Airfix kits. Using plastic card built around a skeleton, the model is thankfully not too difficult, as she does not possess many of the awkward reverse cambers so common on other carriers, and whether the model is built as a wargame unit or simply as a display piece, a very pleasing product will ensue.

Construction of the model covers several phases of manufacture, so in order to make the drawings easier to follow a system of stage construction was embarked upon.

Stages of construction

(1) The first task is to obtain a sheet of .020 plastic card, and cut out the hull sections 'A' to 'K' inclusive. These are cut as drawing size. Note that sections 'J' and 'K' are cut to the level of the deck only, and not to the top as with other sections. The next step is to cut out a base for the model from



Escorted out to sea, HMS Invincible is about to try out her paces as an Anti-Submarine Warfare Carrier.

the .020 plastic card once again. This base should be 50mm wide by 325mm long, and a centre line should be marked along its length with a pencil, at exactly 25mm from each side.

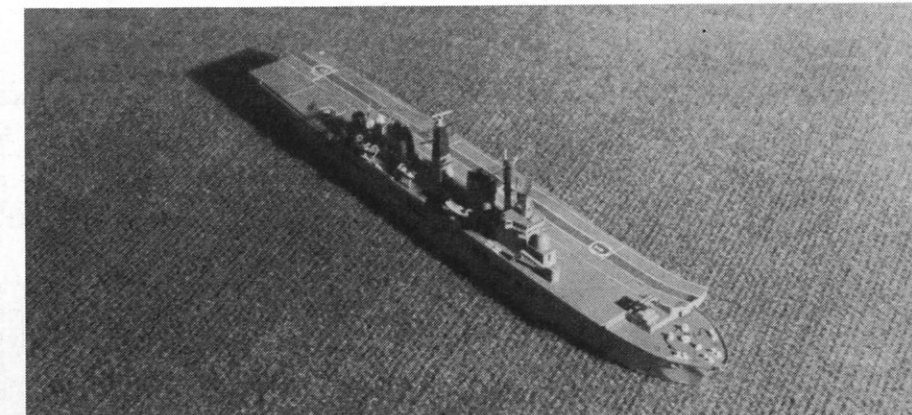
(2) On all the hull sections previously cut out, mark with a pencil the centre points both top and bottom. Then mark on the base plate the exact positions of the various hull sections. Then cement the hull sections to base. Make sure that the centre line on the hull sections is exactly in line with the centre lines on the base, and that sections are positioned at right angles to the base centre line. Using small offcuts of plastic card, make up sections running fore and aft to hold the hull cross members/sections in place. These should be 25mm high, so that they do not protrude above the level of the hull sides. A set square should be used to ensure that these parts are all square, as otherwise, the hull of the model when complete, will take on rather unusual dimensions.

(3) Next item on the agenda is to cut out the flight deck. This is done by cutting out a section of .020 plastic card, 312mm by 54mm overall, and then marking in the outline of the flight deck with a pencil, and cutting off all the waste. A suggested method for this process is to hold the drawing up to a window overlaid with the plastic card and trace the flight deck shape on to it. Having cut the flight deck out to its final sizes, the corners should all be rounded off slightly with a piece of fine sandpaper. Using a straight edge, mark on to the base section the bottom line of the hull using the hull sections as a guide. Then the waste can all be removed with a sharp knife or a pair of scissors.

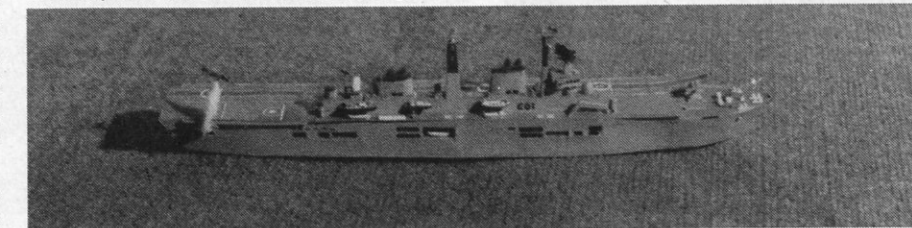
(4) Cut out a strip of plastic card 14mm wide by 49mm long. This is to be fixed along the centre line of the base, between sections 'A and B'. Therefore, the aft end of the strip must be cut down to the angle of the stern. Cut out two more identical strips, and affix in position either side, leaving a gap of 8mm between them and the centre section. These strips act as supports for the quarter deck which can now be cut out and affixed in position on top. Check now, that section 'A' (the stern), is at the correct angle to the base.

(5) Cut a plastic card section of the bow profile between section 'J' and the bow, and affix in position along the centre line of the base, in front of and securely attached to, section 'J'. Then cut section 'K' in half, and cement in position either side of the bow profile as shown. Cut out, and cement into position, the fore deck section between section 'G' and the bow. Now, from a 4mm wide strip of plastic card, cut out and fix in position the forward bulkheads on the forward deck. These follow the line of the flight deck edge at the extreme forward end.

(6) The next step is to fit the hull sides. For this .015 plastic card is used. Cut out two strips of this material 28mm wide and form the stern; from section 'A' forwards to section 'C' on the starboard side, cut out the various openings. Do not cut further forward at this stage as to do so would make



Above and Below: Two views of HMS Invincible in model form in 1:600 scale. Note the boats on the side, from the Airfix Victorious, Tiger and Devonshire kits.



the openings out of alignment as you move further down the flex in the hull side. The two hull sides can now be fixed into place. Working from the stern again, align the cut-outs with the quarter deck openings and cement this section in place from the base upwards and forwards. When the first section has dried, move forwards along the model, bending and cementing one section area at a time, allowing each to dry before proceeding any further. This practice must be followed in order to alleviate the hull sides from springing off again once stuck.

(7) Having finished the hull sides, you will probably find that the sheet was not long enough to plate in the sides in one whole section. This is no problem, as an additional section for the bows can be fixed in later. When both sides are completed, the bow section can be plated in using a thinner grade sheet, such as .005. This is applied in two sections (one either side), and overlaps the existing hull sides where joins have to take place. Application of a full brush of solvent cement down the join, will allow the thin sheet to melt. When this takes place, run your finger or another piece of plastic down the joint. The thinner plastic card will then melt into the existing hull sides so leaving a flush joint.

(8) When the whole assembly so far has dried, any protruding edges of the base plate can be trimmed down to size with the modelling knife, sanding down any left overs with a fine piece of sandpaper.

(9) The next stage before adding the flight deck is to complete the cut-outs in the hull side and box in the openings with plastic strips. This must be done with an extremely sharp knife in order to prevent the hull sides from buckling in with the pressure applied when cutting. If you don't want to go as far as making the cut-out sections and boats therein, this stage can be left out and you can paint in the detail later with black paint. However, in all honesty, this detracts from the appearance of the finished model, and at worst, this process should be reserved for the smallest cut-outs only.

(10) The top of the hull sides should now be trimmed down to the required level in order for the flight deck to be a snug fit. A pair of scissors is the best tool for this job, and a pencil line drawn at the required level will also assist to a great degree. Before fitting the flight deck, however, a pencil line should be made on both the top and the bottom showing the vessels centre line (see drawings). This will assist greatly in aligning the deck when fitting.

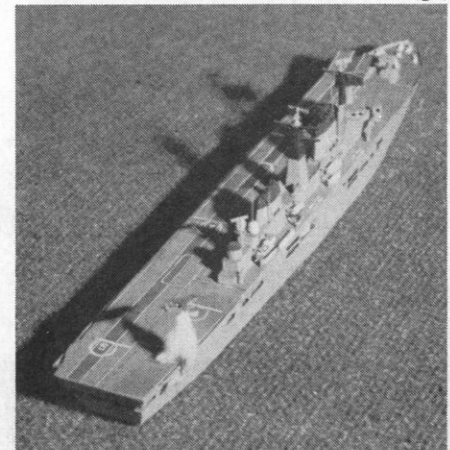
One other item will need attending to before any other assembly takes place, and that is painting. Paint in all the openings and where the box sections are. The sides are Airfix M13 Light Grey Matt, and the decks are Olive Green Matt with the exception of the quarter deck, which should be finished in a dark brown to give the effect of wood planking.

(11) The flight deck can now be fitted into position on the hull. Take care to ensure that the centre lines of both hull and flight deck are in line with each other and the centre line markings on the hull sections. Any gaps left between hull and flight deck at this stage can be filled in with a model filler or the ordinary type of non-solvent plastic cement. Note also that the starboard edge of the flight deck between sections 'C and E', should be flush with the hull side and not overhanging in any way.

(12) Work on the superstructure can now be commenced. Firstly, mark on to the deck with a pencil the positions of the superstructure assembly, and all other parts to be fitted, such as the ski-jump and the Sea Dart launcher. From your sheet of .020 plastic card cut out two strips 159mm long and 17mm wide, on to which are marked the superstructure. Note that the starboard side extends upwards only as far as the funnel bases. Do not therefore attempt to include the funnels in this section. The port side follows the same pattern as the starboard, but at a position directly aft of the bridge superstructure, the port side follows the line of the dipped section between the funnels, not taking into

this cutout, the funnel bases (ie this section is only 9mm high from the bridge aft, to a line square with the little cutting on the starboard side). This difference is due to the .02 deck overhanging the superstructure sides, on the inboard port side.

(13) Now cut out a piece of .020 plastic card to form -01 deck as shown on the drawings,



A rear view of the model with all details completed.

but make it a fraction thinner than shown, to allow for the thickness of the superstructure sides. A strip 7mm wide should be ideal. Affix this section into position between the superstructure sides at -01 deck level. This will act not only as a deck, but also as a support for the two sides. Now cut out a strip 7mm wide, and cut it into small pieces and affix into positions as vertical strengtheners and ends/decks etc. Cut out another section, but this time

10½mm wide. This will form -02 deck, and should be cut and positioned as shown on the drawings, so that the inner port side becomes the overhang.

(14) When this has been completed, the next step is to make the funnel bases and bridge structures. As regards the funnel bases, these are made from layered plastic card, which is then sanded to shape. Following a similar pattern, cut out several sections of plastic card to the profiles of the funnels, then once again layer these and affix to each other, and leave to dry. When dry, these can be sanded down to the shape of the funnels and fixed into the correct position. The bridge structure is made from thin 4mm wide strips of plastic card which are built up to provide the sides and wings etc. The top and base of -04 deck being cut from the .020 sheet again, as before. The exhaust ducting on top of the funnel can be made from biro refill cut to size and packed with filler or plastic cement to give the curvature and flaring required.

Detailing the model

On the tip of the bridge structure, the necessary aerials etc, can now be added, which include a type 965M radar scanner, which is acquired from the Airfix *Devonshire* kit (parts 20 and 21). The scanner is, in fact, two of the single scanners supplied with the kit which are trimmed down and cemented together. While in the process of scrounging bits from other kits, the crane just forward of the bridge is acquired from the Airfix *Victorious* kit, as are most of the ship's boats.

Moving forward to the fore deck, the detail thereon is made from scraps of plastic card and plastic rod. There are four sets of bollards, two anchor winches, and various other oddments which can be obtained from the spares box. In addition, two anchors are required which fit either side of the bow, as shown on the drawings.

Davits, which are positioned down the starboard of the superstructure are once again obtained from the Airfix *Devonshire* box. The boats are acquired from the Airfix *Victorious* and *Tiger* kits as well as the *Devonshire*. However, you will need to make these bits and pieces from scratch, if they cannot be otherwise obtained.

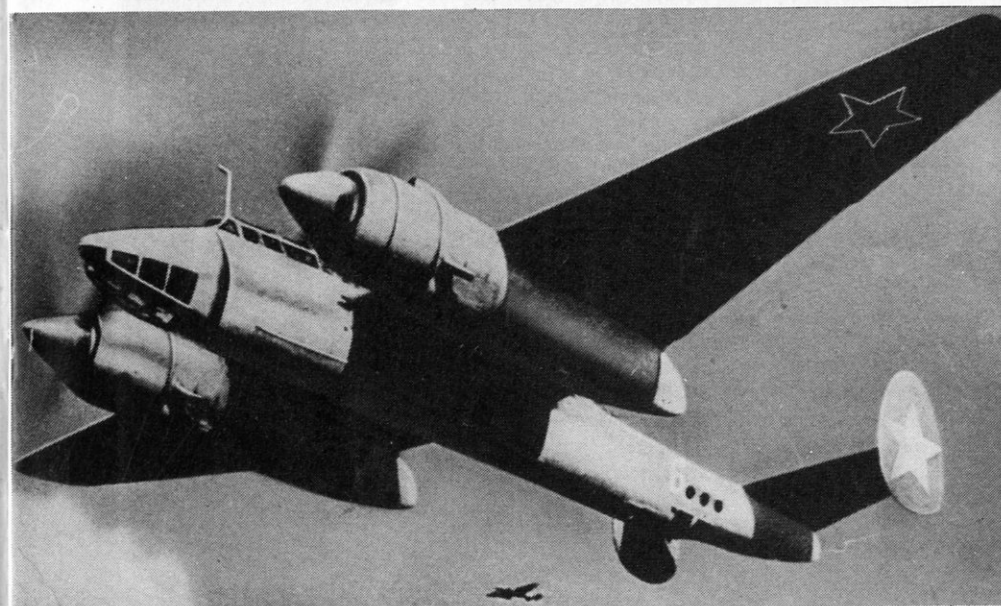
The larger radomes mounted fore and aft are from suitably carved plastic rod of the appropriate dimensions (see drawing). The smaller ones, however, are from either match heads, or the... yes... you guessed it... Airfix *Devonshire* again! The saluting guns just abaft the bridge are made from thin sections of plastic rod, as are the rocket launchers which are mounted abaft the main mast.

The Sea Dart missile launcher, ski-jump ramp, and the various other bits and pieces including the main mast, can now be added. They are all from plastic card once again. Finally, there is only the painting and final assembly to be undertaken, which is fairly simple with the exception of the flight deck, which needs either considerable patience, or a quantity of white Letraset lining tape to complete.

The only stage now left to model is the aircraft which will appear in a later edition.

The Bat — or Tupolev's Tu-2

Peter G. Cooksley looks at a famous Soviet type



A partly retouched view of a Tu-2 on which the shadow of the airscrew blade on the forward fuselage has been seen as a modification that never was. A white outline to the underwing stars was not uncommon particularly on machines that had the top colour carried round the wing leading edge. (Bruce Robertson Collection).

The West's NATO organisation code-named it the Bat but to the Soviet Union the well-proportioned attack bomber with a normal crew of four was known as the Tupolev Tu-2, a type that is strangely absent from much of the literature of World War 2 despite the fact that it was one of the outstanding designs of the period. The reason for this is not difficult to find as it so happened that the machine was to first emerge in its production form in August 1942 at a time when the similar, but older, Pe-2 was being turned out in vast numbers (see *Airfix Magazine*, February 1982 issue for the full story of this machine). The position was therefore the familiar one in time of war where the older type could be produced at something like ten times the quantity of the newer machine and a change-over would have seriously affected the huge numbers that were required. Thus it was a case of making do with the proven production design for Stalin's airforce, and the Pe-2 predominated throughout the war.

Even so, the Tu-2 was produced in sufficient numbers to make its issue possible to a number of units and with the crews of these it proved popular, largely due to its reliability. Subsequently it remained in service in Eastern Europe until as little as some twenty years ago.

Specifications for the type were issued in 1938 and envisaged it as a bomber with a good load capacity capable of both dive and flat trajectory bombing, its speed being required to approximate that of contemporary fighters; its first designation was ANT-58 although the chairman of the design team was in fact Andrei Mikolaeovich Tupolev, previously the chief engineer to the Principal Administration Department of the Aviation Industry.

It was not until the end of January 1941 that the prototype was wheeled out for its first trials although some authorities place that date three months earlier, and before long it became evident that the machine was an outstanding one, some sources laying particular stress on the fact that its performance was enhanced by the cowling design that was regarded as particularly clean at the time. The motors were Mikulin AM-37s each delivering 1,400hp, power plants that were soon to prove troublesome.

A second prototype was constructed almost simultaneously and this made its own first flight in company with another about five months later. By now the design had undergone some extensive modifications which were sufficiently comprehensive to justify a new designation so that the type was now known as the ANT-59. Changes that had been incorporated included a lengthened fuselage and provision for an additional crew member, so that the

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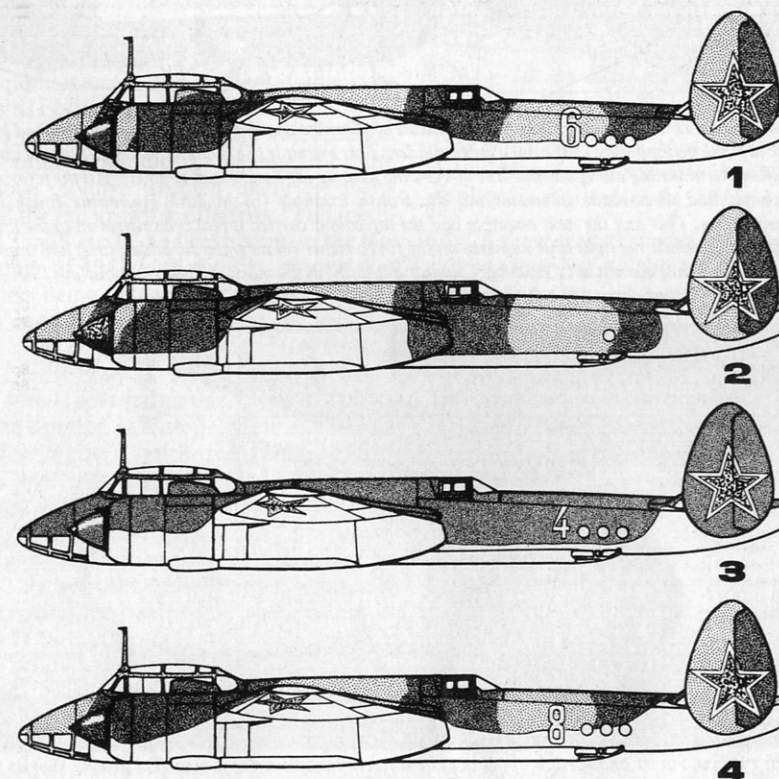
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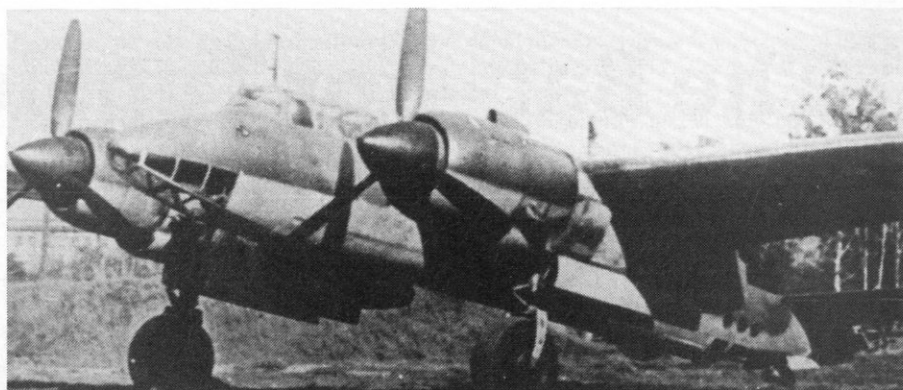


A Tu-2 in standard green/brown/sky blue finish is shown in (1); note how the upper colours are 'wrapped round' the wing leading edge. Side numeral and outline to the lower surface stars is white. This contrasts with the machine in (2) which has a lower camouflage demarcation line, and the top colours are taken on to the sides of the nacelle trailing edge. Spinners were red. A Soviet machine in dark green/blue finish (3) has a rougher and higher camouflage line, while the under wing stars lack an outline. Note the form of the side numeral. A different camouflage line again marks (4) which like the first example has dark green spinners. There was no margin to the national marking underneath and the individual number was white.

all-up weight of the bomber was increased as a consequence. Larger diameter aircrews were also fitted.

All seemed set fair for the successful continuation of the test programme but this was not to be, for it was not long before one of the liquid-cooled motors burst into flames and the two men aboard had to abandon the machine. Unfortunately one of them was to die when his parachute became caught up in the doomed aircraft which was destroyed in the resultant crash.

The aircraft as it now existed had, except for the prone gunner's position under the rear fuselage, a superficial resemblance to the Messerschmitt 110, but this was to be changed by the decision to fit new power



This photograph has been reproduced elsewhere as showing the Tu-2S. In fact the span is extended indicating that the type is in fact the Tu-2R which also had an increased fuel capacity. Note again aircrew blade throwing shadow on fuselage. Some details of the undercarriage legs may be made out in this view. See also the photo below. (Bruce Robertson Collection).



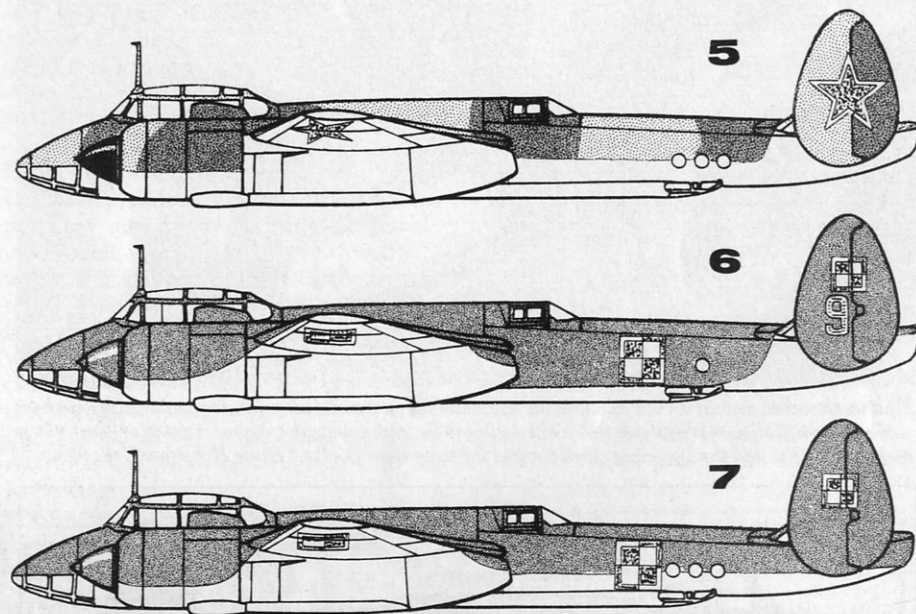
Examples of (upper pair) individual number style on Soviet machines with (lower pair) specimens typical of Polish numeral style. In all cases these varied black or white according to background dope scheme.

plants. These were to be radials in the form of fourteen-cylinder, twin-row M-82s of 1,330hp each, so that another change of designation took place, the type now being known as the ANT-60.

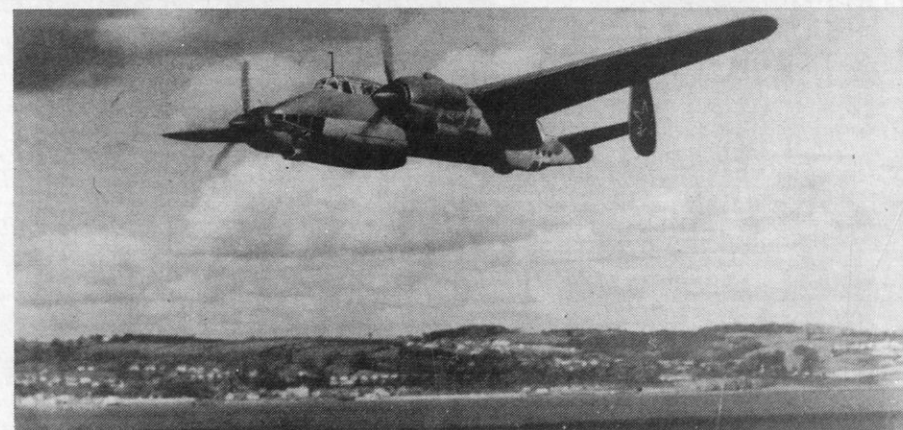
A difficult choice

Tupolev's design bureau now found themselves faced by a dilemma for the new model was capable of only an inferior performance when it flew for the first time at the end of 1941 when figures were compared with the results of the earlier version's tests, but the radial motor was unquestionably more reliable so that despite a maximum speed that was a little under seventy miles per hour poorer, it was deemed wiser to go ahead with the new engines as standard.

Flight trials with the ANT-60 were still incomplete by some four weeks when the pre-production aircraft emerged from the factory. These were the first machines to be known as Tu-2s and all three were sent for operational evaluation. The reports on this were pleasing, for under combat conditions the motors had continued to prove reliable



Some Tupolev bombers had a smaller Soviet star instead of the more common fin marking that touched both leading edge and the trailing edge of the dark green rudder. This example (5) is one such which had the upper wing camouflage terminating along the mid-line of the wing leading edge and black spinners. All the foregoing Tu-2S machines had three-blade airscrews but the Polish example (6) in dark green/blue finish had four-blade airscrews. This and the next example had the top colour carried a few centimetres on to the lower surface of the wings, while the light blue numeral on the fin (a richer colour than the underparts) had a white outline. Another Polish specimen at (7) was very similar but with, in the main, a higher camouflage line. The individual number '3' was carried in white on the inner faces of both fins.



Although this official Soviet photograph appears to be a fake montage using a modified ground shot as the basis, it gives an excellent impression of the Tu-2R in flight. (Bruce Robertson Collection).

and it was even possible to fly on only one of these should the other be damaged. In addition to this, the bomb capacity of 4,410lb came in for particular commendation as well as the defensive armament which consisted of not only the twin 7.62mm guns in the upper and prone dorsal

positions, but also the twin forward-firing 20mm cannon (ShVAKs) close-set in the wing roots.

Despite the fact that ultimately something in excess of 2,500 Tu-2s were produced the difficulties under which this was achieved will be realised when it is

stated that the decision to produce the new attack-bomber in quantity was taken at the same time that the complete Soviet aircraft industry was on the move towards the East, where it was hoped, evacuation would place it beyond the range of the German invaders.

Modified for simplicity

Quite obviously a move of this magnitude was impossible without some sacrifices but such was the state of the conflict that on no account were these to take the form of reduced production numbers. The only remaining option was therefore to go for simplicity.

To achieve this was not especially difficult for the Tu-2 was amongst the more complex Soviet aircraft of the period so that Tupolev immediately began work on perfecting a modified version with less complex characteristics. The result was the best-known version of the machine, the Tu-2S, the type that could be produced in something like eighty per cent of the time formerly required for the bomber, a figure achieved mainly by the incorporation of less sophisticated hydraulics and electrical systems, although structural methods were also slightly changed. Armament also was different, the lighter calibre weapons in the rear-firing positions being replaced by single 12.7mm UBTs.

New motors

In addition to this an engine change took place along the lines of a modification initially tried out on at least one of the former Tu-2s. This was the substitution of a pair of the more powerful Shevetsov ASh-82FNs capable of delivering 1,523hp, although later in the career of the type ASh-82FNVs were used.

By now it was 1944 and the war situation was again beginning to change, but the Tupolev bomber seemed likely to prove ideal for the growing offensive. The modified Tu-2S model had first flown in the late summer of 1943 with the first production models being delivered about five months later but, despite the fact that the war was now plainly drawing towards its close, a little under half of the production figure was delivered between this time and the end of the fighting in Europe.

Nevertheless, despite the short time span that was left, into this was packed the design work necessary to produce a whole galaxy of modified versions. Of these, perhaps the least-known is the spectacular Tu-2 Paravan that was fitted with a fender protruding forward of the nose by almost twenty feet and supported at each wing tip that was intended to be used as a type of aerial 'mine-sweeping' operation to clear bombers' paths of barrage balloon cables. In appearance the equipment can best be likened to that of the similar devices carried by some Luftwaffe Heinkel 111s.

Almost inevitably there followed a long-range version that was intended for reconnaissance and some of these were distinguished by four, instead of three-bladed airscrews. The first of these was the Tu-2D but it was quickly followed by the somewhat similar Tu-2R with increased fuel

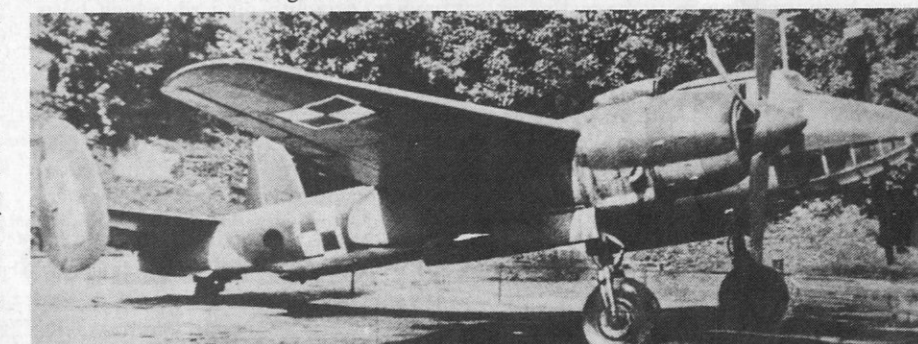
capacity too and a greater wing span, plus vertical and oblique cameras.

Development continues

Although the time when the Tu-2 design was to undergo extensive service in the attack-bomber and ground support roles was now drawing to a close, its dive bomber capability never having been fully utilised, its active service life was sufficiently long to prove that in the post-war world there was enough potential in the design to warrant continued development, a fact marked by the award of two State Prizes to Andrei Tupolev, the first being directly in recognition of the work on the Tu-2.

The post-war world therefore saw the continued evolution of several developments, the first of these being that known as the Tu-2Sh. This suffix indicated a 'sturm-ovik' or ground attack version, a model distinguished by a new nose design from which all glazing had been eliminated. Into this was fitted an RShR anti-tank gun of 57mm calibre and the trials begun in late March 1946 proved promising.

There was to follow nine months later a new torpedo-bomber version, the Tu-2T, the same type that is occasionally described under its alternative designation of ANT-



A Tu-2S in Polish colours. Note the four-bladed airscrews, single windows over the ventral gun position and numeral (9) under the national marking on the fin. Some Polish Tupolevs and indeed Pe-2s had instead, the individual number only on the inner face of the fins. (Bruce Robertson Collection).

62T. A crew-trainer model, the Tu-2U was also produced about this time.

Another engine change

The Patriotic War, as World War 2 is known in the Soviet Union, was not yet won when consideration was given to a fresh change of motor that first appeared in May 1944. In fact the resultant new version, designated the ANT-63 SDB was little more than a prototype resulting from a standard Tu-2 with 1,870hp AM-39 engines, and it was intended that the type would be suitable for use as a three-seat escort fighter. Knowledge gained from the trials with this version was incorporated in the subsequent ANT-63P, the production model also known, surprisingly, as the Tu-1. Armament of this was entirely concentrated to the front, the ventral position being deleted in favour of the four fixed 23mm ShVAK cannon. The motors too were changed, now being the liquid-cooled AM-39Fs giving a total of 4,000hp so that a maximum speed of over 400mph resulted. This version, of which at least one was sent for trials with motors of increased power, was produced in small numbers and issued to operational units.

Versions of the Tu-2 that followed were in the main experimental models, the sequence logically following in the production of the ANT-64. This was intended as an engine testbed and was fitted with in-line motors of the AM-42 type. Next was the ANT-65, distinguished by increased nose-glazing and powered by motors fitted with turbo-superchargers, the AM-44TKs. However the maximum speed was disappointing despite the enhanced ceiling.

Also an engine test-bed was the following ANT-67 fitted with Charomski diesel motors although the ANT-68 (Tu-10) was a bomber version of the ANT-63P (Tu-1) escort fighter. All these variants appeared during the period between 1946 and 1948 as did the ANT-69 otherwise the Tu-8, the version of the Tu-2 fitted with ASh-82FNV motors already mentioned. On this model the armament was also changed with the forward battery now consisting of NS-23, 23mm cannon while B-20s of heavy calibre replaced the earlier rear guns.

While these versions may now be mainly of academic interest alone, the same cannot be said of the versions modified for more immediate military purposes so that one result was a variant modified to carry a command car, partly protruding from the

bomb cell, while another version of the Tu-2S resulted from modifications to carry early jet motors on test slung below the belly and in this way the British Rolls-Royce Nene and Derwent engines underwent trials following the presentation and export of samples to the Soviet Union by the British government of the period. This was the time when the change-over to the new method of propulsion with all its associated problems* was occupying a great deal of the thoughts of the aircraft industry the world over, so that ex-enemy engines like the BMW jet series were also subjected to trials in the same way.

Surprisingly, for a machine first developed in 1941 the type, comparatively elderly by the standards of the day, was to soldier on for more than a decade, not only being produced for such as the Polish and Chinese air forces but also being encountered by British and American pilots in the colours of North Korea during the war in that country in the early 1950s. Tu-2 production did not cease until 1950 and the type survived long enough to receive a NATO codename — Bat.

* See also *Skystrike* by Peter Cooksley (Robert Hale, 1980).

Modelling the Tu-2 — from the Plasticart 1:72 Scale kit

If you collect World War 2 or Soviet aircraft models, then the Tu-2 kit from the East German firm of Plasticart will undoubtedly interest you. It has become available in the last year from Plasticart's UK distributors, Scale Model Distributions, Scan Buildings, Oldbury Road, Cwmbran, Gwent. New kits of World War 2 types in 1:72 scale have not exactly been tumbling on to the market in recent years, so it is pleasing to have a 'new' kit in this area. Actually this kit does not look new, for even if it is a fairly recent production on the East German market it exhibits the characteristics of a 1960s style kit, complete with 'solid' cockpit interiors and 'head and shoulder' pilots. The parts look thick and shiny, too, and at first glance the model does not look too inspiring. However, press on regardless, for the completed model is quite a pleasing realisation of the real thing, certainly capturing its looks and character, even if it proves to be slightly inaccurate.

Checking up on this one proved fairly difficult, in fact. Such drawings and silhouettes as I can find published in various books do not agree among themselves, and this model may well prove to have errors of the usual sort, such as wings too narrow or undercarriage too high. The kit does not identify the actual variant, but it appears to be the common Tu-2S variant, complete with four-blade propellers. In component form it looks nothing like a Tu-2 and it is not until the very good, clear, glazing sections are added that the graceful shape really materialises and suddenly the model looks very realistic. The one noticeable simplification is the exhaust outlets on each side of the engine nacelles. As supplied they are straight and centred each side of the nacelle. From photographs, they should be cut off, filed to a slightly more rounded cross-section, then cemented back in place with the outlets canted slightly downwards (instead of straight) and about 1mm lower down on the nacelle sides. The bomb doors are arranged to open, with some rather heavy hinges provided. I cemented the doors in the open position and used the hinges provided to block the rather heavy slots provided for the working version.

The other changes I made to the model

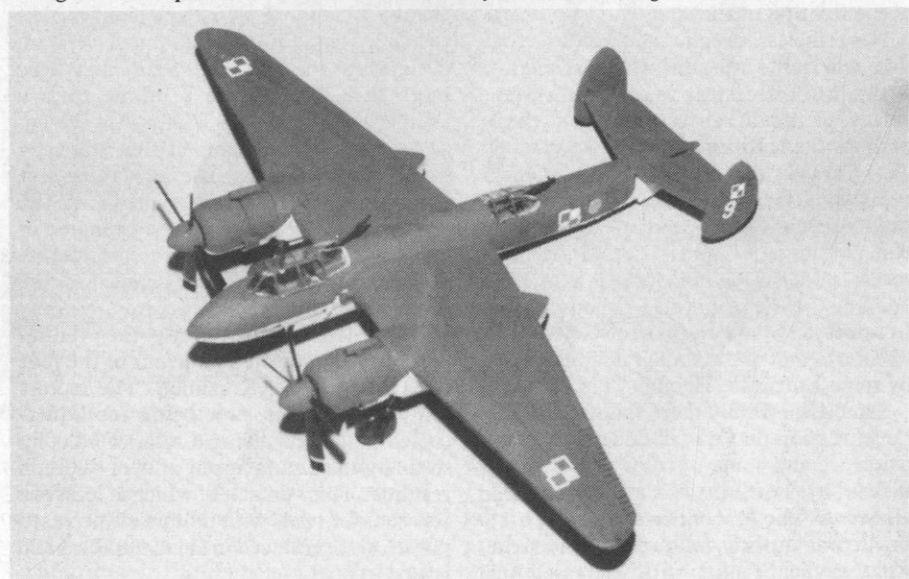
were mainly cosmetic. The most necessary change is to cut out the cockpit and dorsal gunner positions. You could also cut out the corresponding parts for the lower nose glazing and the ventral gun position, but I do not think this strictly necessary. The cockpit is sawn out with an X-acto razor-saw, the main need being to cut away a prominent strengthening rib which butts below the 'solid' section. Using plastic card and scrap I then added a cockpit floor, two back-to-back seats, the dashboard provided in the kit, and miniature controls. A floor and seat were similarly added in the dorsal gun position. The machine guns themselves were added when the canopies were positioned after painting. As the glazing is very sharp and clear the added cockpit detail is very visible, so this effort is well worth while. The rest of the work is mainly concerned with cleaning up join lines, etc. As the wing plastic is fairly substantial you might like to try cutting out the control surfaces and cementing them back with a 'droop', though I did not do this. The other cosmetic change I made was to eliminate the clumsy toy-like bomb racks under the wings, rubbing the whole area smooth. A full bomb load is provided, but if you want to fit it I suggest you find some neat bomb racks from the spares box and use them — though another problem is that I've never

seen any pictures of a Tu-2 fitted with racks under the wing.

Peter Cooksley has provided several colour schemes in his article, and I chose the Polish aircraft coded 9 in post-war days. The markings came from spares left over from other kits and the numeral 9 was a white transfer touched in with light blue after application. You will also need to fill in the stand slot if this is not required and check your subject. For though Polish 9 has the single fuselage port as provided in the kit, many machines are shown with three slightly smaller ones. If you choose this variation rub down the domed glazing for the single port, then drill out three new holes in line, as shown in Peter Cooksley's drawings. Take care painting the framing on the glazing for if this is done neatly it will help the model capture the essential character of this lean machine. Add the glazing after all other painting is complete, using clear universal cement, or white PVA glue applied thinly.

Chris Ellis

The finished model marked as a post-war Polish Air Force Tu-2S, coded 9. Removing the very crude and prominent bomb racks under the wings goes a long way to improving the looks of the model. They are moulded into the wing and must be carved away, after which the wing is rubbed down.



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Women wanted

by Christine Lake



Success in life, for the majority of women before the First World War, depended entirely on whether, like the Canadian Mountie, she 'could get her man'. Exploited by a society that paid little enough for a man to do a day's work, a woman found it impossible to survive on what she could earn on her own. Any husband was therefore better than none — the alternative, of becoming an old maid and supported by an unwilling male relative, was an intolerable situation to be avoided at all costs.

The advent of the typewriter had made it possible for a certain type of woman to find employment but ultimately did nothing to improve her lot in life. The typist/secretary became so associated as a feminine pursuit, that

seventy years on, she is still tied to that machine as an entry into the business world. The other professional occupations which were open to women, those of teaching and nursing, had neither equal pay nor true recognition of their professional status. One consequence was that few women entered nursing and when the wounded soldiers limped home from the war, there were not enough beds to go round and not enough trained nurses to look after them. Proof perhaps, that prejudice ultimately does more damage to the holder than the person it is aimed at.

A woman from the working classes faced an even bleaker life than her middle-class sister. If she could not get into Domestic Service which at least

provided some sort of training and an opportunity to 'better' herself, then factory work or home work were the usual alternatives. Hours were long, wages were low and working conditions generally appalling. In 1911 around the Bermondsey area in London, the average yearly wage for a woman factory-hand was £23 in comparison to the £75 earned by a man.

Meanwhile, the Suffragettes were hitting the streets, strident in their demands to gain votes for women and thereby control the social and economic policies that were the cause of so much of their own misery. By 1912 the famous hunger strikes and force feeding had begun and the sympathy of women from all ages and



The woman here can be seen making laces out of condemned boots, 1916 (IWM-033289).

backgrounds, aroused. By 1914, the Prime Minister Mr Asquith announced that he was now prepared to back a woman's suffrage bill. Whether he would ever have done so, is now a matter of conjecture, for the declaration of war against Germany, the same year, put an end to all negotiations. Women told themselves that it was their duty to put aside their campaign and concentrate all their efforts into winning the war. Yet what could they do? While the men rallied round to the recruiting offices, the women fell back on their traditional role of knitting socks and making cups of tea. Even a demonstration through London where 11,000 women demanded the right to serve their country, proved ineffective against the

opposition of the trade unions, anxious to preserve a male working environment.

Work at last

The story changed dramatically however, when Lloyd George was appointed Minister of Munitions in 1915. He needed labour and he needed it fast; he did not want to draw upon men who would be called for fighting so he turned to women for the solution. They were ready and more than willing. Here was the chance that many of them had been waiting for — a chance to prove that they could do a 'man's' job and do it well and what's more, get paid a man's wage. The way had already been paved for them by the publication of a *Handbook of Employment* by Lord Northcliffe, suggesting new areas of work for women such as lift attendants and railway booking clerks. Britain accordingly became witness to the strange sight of women acting as tram conductors, ticket collectors, van drivers and milk and post deliverers. The nation was shaken to the bottom of

its moral fibre, but it was a national emergency and the women quickly became accepted and even approved of. The job of bus conductress soon became a firm favourite with many of the women as it was one of the few occupations that actually paid equal wages, but the Services also proved popular. Volunteers joined the Waacs, the Wrafs, the Wrens and even the Women's Legion in their efforts to help their country.

In one fell swoop, the social, economic and political barriers had been cut through. Even the trade unions finally had to give way and offer their grudging blessing. They had spent so much time trying to control the output and conditions of working men before the war, that the last thing they wanted was for women to come along and upset the system. There was also the real fear of women retaining their rights to continue working after the war and thereby possibly creating unemployment and lower wages for men. So finally with the proviso that the women must give up their jobs when the men returned, they



Picking up the post, this lady is about to set off determinedly for the next box (IWM-12136C).

swallowed their pride and allowed women even into the munitions factory.

Once there, the women set to work with a speed and a will that often outstripped the men. One employer actually reported that their output was double that of trained mechanics. They still did not receive the same wages as a man (despite a treasury agreement of 1915 to do so) but the money was still a lot more than they had been used to. The projectile girls could earn £3 4s 2d a week which was about three to five times their previous earning power. For the first time in their lives women found that they could support themselves and even their families; they bought decent food and felt healthier and happier for it. As a work force in fact, they had become so valuable that the government were careful to continually praise them for their efforts. By 1917 when the front had claimed most of the men from the factories forcing the women into heavy manual work (which they had previously never been thought capable of doing) the government made sure that they had suitable breaks and clean washing facilities, to ensure the good health of their 'valiant' workers.

Lloyd George's Land Girls

Women had proved themselves fit and capable in the towns, but what of the country? Agricultural labourers had been even more badly paid than their town counterparts before the war. Their wives had faced a long struggle of bringing up a large family with little money and no prospect of improvement. By 1914 food



Munition workers busily engaged in making shells for the war effort. Note their working clothes of hat and apron over long skirt and blouse (IWM-Q33227).

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production started to become a cause for concern. Imports were being cut back and German U-boats were sinking many supplies. Although the organisation of Women's Institutes did have some effect on produce by encouraging women to keep chickens and grow vegetables, it was too locally based to be of much use nationally. Too many skilled men labourers had joined up and cultivation was suffering. The Board of Agriculture therefore tried to encourage farmers to employ girls to work the land, but like the trade unions, the farmers refused. Why should they use women when schoolchildren were so much cheaper and besides, how could a woman possibly help with heavy tasks such as haymaking?

Opposition or not, the situation was becoming so desperate by 1917, that regulations were passed forcing farmers to grow what they were told to by the Ministry of Agriculture. At the

same time, land girls were introduced as a recognised part of the labour force. Women were encouraged to volunteer and were then trained at a government training centre where they were sent out to act as a full time worker on the land. The farmer had to provide proper accommodation in addition to which, the girls were given free railway passes and a free uniform. This consisted of breeches, a jacket, boots and a hat — a far cry from the demure long skirts of only a few years back — but eminently more practical. After the initial gasp of horror, these land girls were for the most part treated very well by both the community and press at large.

Thus women had shown the government and employers that they could tackle practically any job that a man could do. They felt confident and secure in their new role, so what was going to happen at the end of the war? How were the men whose jobs they had slipped into, going to react? The answer was a simple one. The men wanted pre-war conditions to be restored. The government and trade unions were committed to it. The 'boys that came home' had changed beyond recognition; scarred and often maimed both mentally and physically, these men needed peace and active employment. How could women put up a fight? It was an impossible choice, and women withdrew gracefully. By 1921 according to the census, women were back in their old occupations: 4% in teaching, 23% in the clothing and textiles industry, and 33% in domestic service. Yet the door of freedom had been opened and would never quite close again. In the long years of struggle that followed the aftermath of war, it was pushed open, inch by inch, until it stands in the position of today, beckoning, and half ajar.



Repairing guns, these women must have found the fresh air a welcome release from the factory floor (IWM-Q33600).



One of the first jobs in a boot repairing factory was to actually clean the mud off from the Front (IWM-Q33285).



Sorting out uniforms in an Army Ordnance Depot, the pile of jackets and trousers behind the women grow steadily higher (IWM-Q7955).

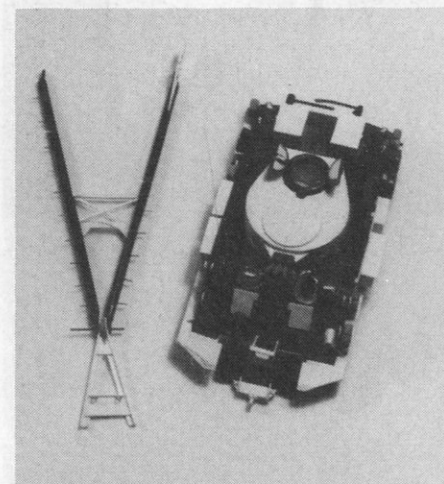
Israeli M32 ARV

Conversion details by Tim Neate

The M32 dates back to World War II but it is still in service in such countries as Austria, Brazil, Israel, Japan and Yugoslavia. Photographs show that the Japanese and Austrians are still using the original suspension system, but the Israeli's have the new horizontal volute suspension (HVSS) fitted to their M32's. Minor differences on the M32 exist from country to country, for example the storage of tools and spare parts varies between each nation. Israel in particular, as with so much of their equipment, have modified their machines quite considerably so that a model based on their design modifications is a very interesting one to add to your collection.

Hull (Bottom)

You will need one Airfix Sherman and one Matchbox M40 kit. Take the Airfix Sherman and glue parts 4, 24, 42 and 41 together. Fill all the holes in parts 4 and 24 except for the drive sprockets and rear idler holes. Next



Photos and illustrations by the author.

turn to the Matchbox M40 kit; assemble all roadwheels, drive sprockets and idlers as per instructions. Then very carefully cut the running gear fixtures off parts 6, 7 and 8. This should then be transferred to the Sherman kit and running gear glued on. When this is completely dry, measure up the tracks against the running gear and shorten to fit.

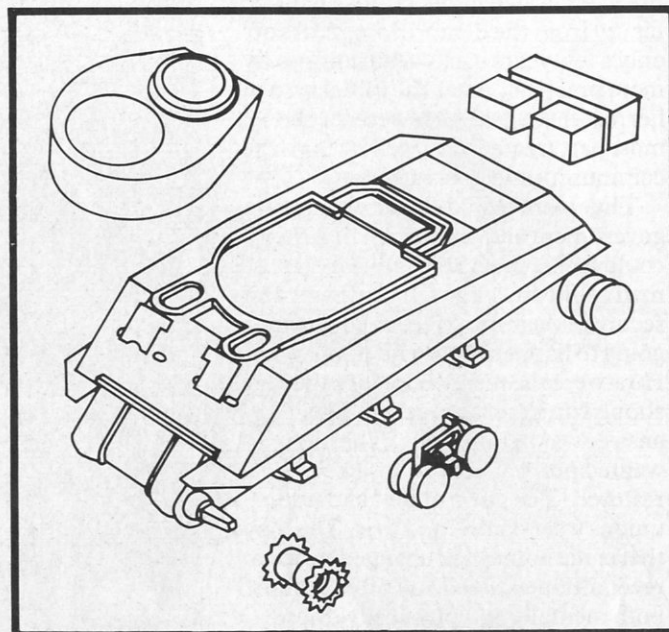
Hull (Top)

Take part 43 of the Sherman kit and scrape off the lights and pioneer tools. Add parts 44, 45 and 46 as per instructions. Parts 44 and 45 can be modelled open or closed, but you must remember to add the periscopes which protrude inwards as well as outwards.

With the new suspension system (HVSS) with wider tracks, you need to add track guards. These are supported with little triangular struts from above. Two pieces of extra armour also need to be added to the hull just in front of the hatches. Two 'A' frame mounting eyes have also to be joined on where the hull front starts to slope down. Then make the roller unit and place in the centre of the hull front.

The rest of the hull is made up of storage boxes along the sides and on the rear deck. Jerry cans have special holders on the track guards. The spare

Two views of Tim Neate's model before and after the 'A' Frame has been fitted.



road wheels bolt on to two studs on the left hand side. The front towing unit is built out, but at the back there is just a tow hook. Behind one storage box on the left is a rack for a split drive sprocket. Do not forget the whip ariel, securing eyes, hand rails and lights.

Winch Housing (Static Turret)

Use the cupola parts 49, 51 and 52 from the Sherman kit. Small cushion pads should be placed on the inside of the hatches as well as a periscope. Also add a machine gun mounting. Then cut out the top, bottom and side, (of a suitable height) out of plastic card. Glue this around the top and hold until dry, then do the same for the bottom. When thoroughly dry, cut off the excess plastic card from the side. You will now have a hole at the back of the winch housing which you should fill in with a piece of plastic card. Cut a hole in the roof to take the cupola, and cut a plastic disc to glue on to the roof for the winch access cover. There are two spare road wheel studs on the front along with the winch food out flap and two pointed structures.

'A' Frame

Using plastic rod or cleaned up sprue of a suitable size, flatten each end of the poles to fit between the mounting eyes on the hull and on either side of the pulley. This is done by cutting more



A close-up of an M32 Recovery vehicle modelled by John Longmuir. Note the Jerry can on the front along with the other useful items that a soldier would not want to be without.

than you need in length. Each end is then heated until the plastic is very soft which should then be quickly squeezed with a pair of pliers. These ends should now be cleaned up and drilled for hinging pins and pulley wheel.

Glue on the support gantry, which should fit in between the 'A' frame poles at the rear. Extras such as canvas tilts, stores, buckets and oil cans can always be added according to taste and

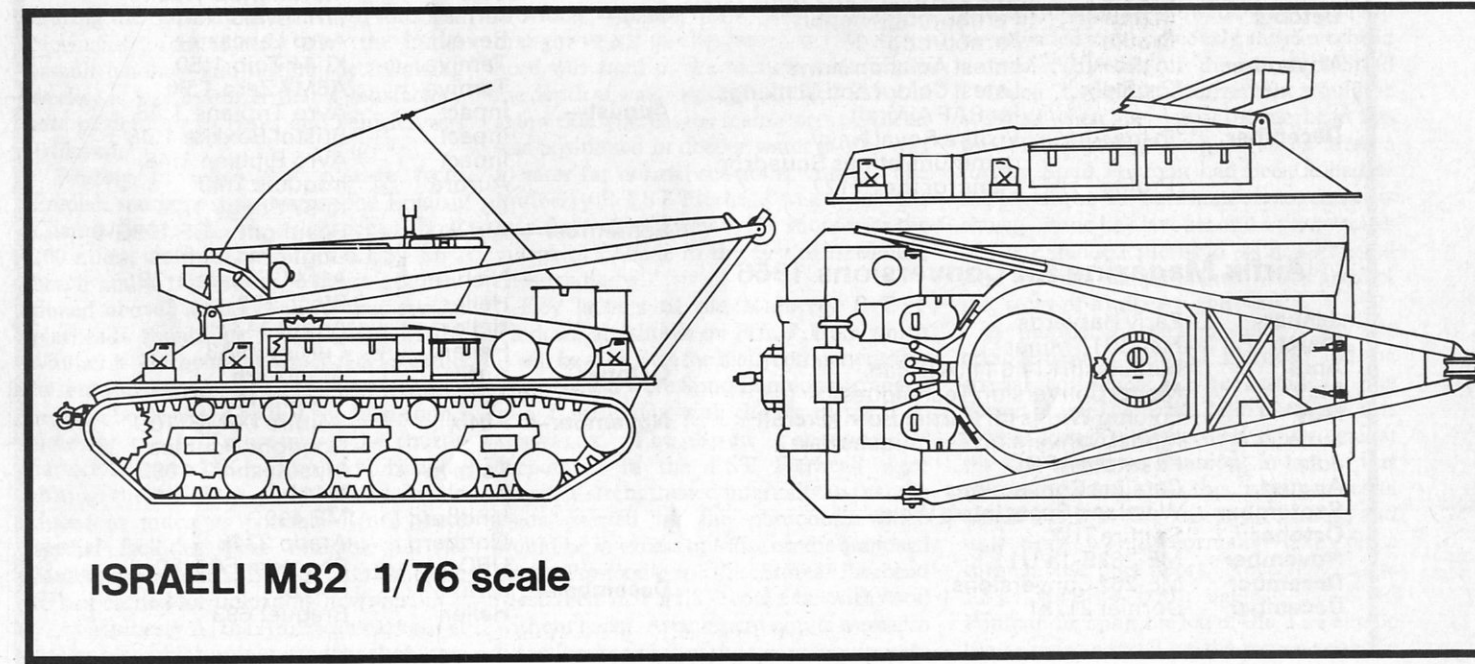
how much time you have.

Painting

The registration number is white on black ending with the Hebrew character **Y**. This is usually applied to the front and back, and occasionally to the sides. The overall colour is a stone/sand colour mixed from Humbrol Matt No 34, 72+ and 95.

References

War Data No 6, Sherman (Israeli M32).
The Great Tanks by C. Ellis and P. Chamberlain (Israeli M32).
Janes Combat Support Equipment 1978-79. (Austrian M32).
Janes Combat Support Equipment 1980-81. (Japanese M32).
Japanese Panzer Magazine No 11, (Japanese M32).



ISRAELI M32 1/76 scale

Aviation Index: 7

Compiled by Phil Hunt



Airfix Magazine Aviation Articles 1966

January	'In the Air'	DC9 Development
	'Profile'	B-29 Superfortress
February	'In the Air'	Acrobatic Flying
	'Profile'	B-29 and its derivatives
March	'In the Air'	Anti-sub Helicopter Ops'
	'Profile'	Fairey Firefly
April	'In the Air'	Vintage Aircraft Movements
	'Profile'	Short Sunderland
May	'In the Air'	Problems Facing British Airports
	'Profile'	Fireflies
June	'In the Air'	HS 125 (Dominie) in RAF Service
	'Profile'	Westland Scout Army Air Corps
July	'In the Air'	Airshow Round Up
	'Profile'	F-5 Freedom Fighter
August	'In the Air'	Visit to the Hovershow, Flying in the Short Belfast
	'Profile'	Colour Schemes and Markings from Recent Airshows
September	'In the Air'	Recent Navy Air Days
	'Profile'	Story of the F4 Phantom
October	'In the Air'	Farnborough Report
	'Profile'	Farnborough 66
November	'In the Air'	Latest Aviation News
	'Profile'	Latest Colour and Markings for RAF Aircraft
December	'In the Air'	Visits a Royal Navy communications Squadron.
	'Profile'	Plans for the P1127

Airfix Magazine Kit Conversions 1966

January	Early Harvards
March	Fiat G91 Trainer
April	Mitsubishi Ki-46 111A Dinah
May	Model Conversion Techniques
May	Folding Wings for Carrier Born Aircraft
June	Model Conversion Techniques Part 2
July	Phantom RF-4C
August	Catalina Conversions
September	Westland Scout into a Wasp
October	Spitfire TrIX
November	ME-262B-1a/U1
December	ME-262 Conversions
December	Dornier 217k1

Airfix Magazine Kit Reviews 1966

January—	Airfix	B-29 Superfortress
	Tamiya	Kawasaki Ki-100 1:50
	Tamiya J2M3	Jack 1:50
	Tamiya	A6M7 Zero 1:50
	Tamiya	Kawanishi George
February—	Airfix	TBM-3 Avenger
	Airfix	Firefly V
	VEB	IL-20 1:100
	VEB	IL-62 1:100
	VEB	AN-24 1:100
	UPC	Mitsubishi Ki-15 1:50
	UPC	Jake Floatplane 1:50
March—	Tamiya	C6N1 Myrt 1:50
	Lindberg	ME 163
	Lindberg	HE 100
	Lindberg	HE 162
	Lindberg	FW 190D
	Revell	FW 200C3/U1
April—	Revell	Boeing Kaydet
	Revell	F-105 Thunderchief 1:75
	Revell	PZL P-11C
May—	Airfix	Freedom Fighter
	Airfix	Westland Scout
	Inpact	Bleriot 1:48
	Inpact	Deperdussin 1:48
	Inpact	Handasyde 1:48
	Monogram	Mosquito 1:48
	Renwall	Bleriot XI
	Renwall	Kittyhawk
	Renwall	Curtiss Golden Flyer
	Renwall	Avro Triplane
	Renwall	Antoinette
	Renwall	Voison Farman
	Revell	Fokker DR1
	Revell	Sopwith Triplane
	Revell	Fiat CR42
	Revell	F-102 Delta Dagger
	Revell	F-94C Starfire
	Revell	A3 Vigilante
June—	UPC	Martin MB2 1:75
July—	Airfix	Whirlwind Harl
	Revell	Avro Lancaster
	Tamiya	Ki-44 Tojo 1:50
	Tamiya	A6M7 Zero 1:50
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	Inpact	Bristol Boxkite 1:48
	Inpact	Avro Biplane 1:48
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	LS	Ki-67 Peggy 1:75
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	Heller	A5M4 Claude 1:72
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	Heller	Amiot 143
October—	Heller	Curtiss 75A3
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November—	Airfix	Trident 1C
	Airfix	Spitfire IX/ME110D
	Tamiya	Dogfight Doubles
	Revell	Mitsubishi Ki-109B
	Lindberg	F-111
	Lindberg	ME 410
	UPC	Arado 234B
December—	Airfix	Phantom F4 1:50
	Heller	P-47D
		Breguet 693

MULBERRY HARBOUR

By Geoffrey Futter

Part 9

The LST Pierhead

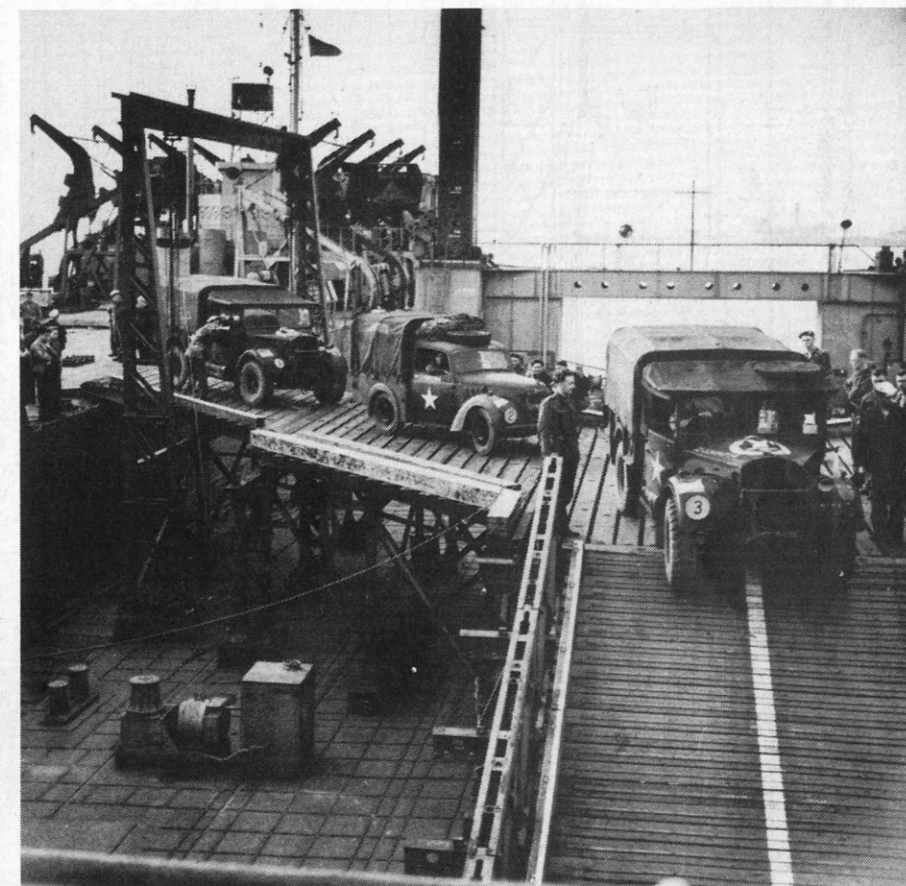
When the design of the LST Mk. 2 (the only type of LST to see operational service during Operation 'Overlord') was conceived it was envisaged that its role would be to discharge tanks and vehicles under their own power directly through bow doors on to beaches in support of assault landings. The LST Mk. 2 was accordingly designed as a flat-bottomed shallow-draught vessel which drew only about 37 inches at the bow when loaded for beaching. Armoured vehicles were carried within the hull on a deck which was situated just above the water line and wheeled vehicles were usually carried on the exposed upper deck.

The vehicles carried on the upper deck were transferred individually to the lower tank deck by a lift and then driven out of the bow doors once the deck had been cleared. Altogether 236 LSTs Mk. 2 were allocated to the initial assault forces for the D-Day landings. The majority of these continued in service during the build-up of the Allied forces in Normandy when they ran a shuttle service across the English Channel.

To unload the cargo of tanks and vehicles from a LST directly on to a beach was a fairly slow process, particularly during the transfer of the vehicles by lift from the upper deck. The whole unloading operation could take between 1½ and 2 hours. During the build-up of the Allied forces in Normandy, immediately after the initial assault landings and during the following weeks, it was essential that a satisfactory rate of delivery of tanks and vehicles was achieved.

Bearing in mind that passage from English southern ports across the English Channel and return was a distance of about 200 miles, and that to unload a LST on a beach could take up to 2 hours as mentioned above, it was decided that special pierheads should be incorporated in the Mulberry Harbours at which LSTs could be unloaded more rapidly. The pierheads were to be designed so that the turn-round time for the LSTs operating the shuttle service between UK ports and Normandy during the build-up period could be reduced as much as possible. Until these special facilities were available in the Mulberry Harbours, LSTs would continue to be beached for unloading however.

At Mulberry A, the American harbour at St Laurent which only existed for about two



British Army vehicles leave the upper deck of a US Navy LST at the Mulberry B LST Pierhead (IWM-B8446).

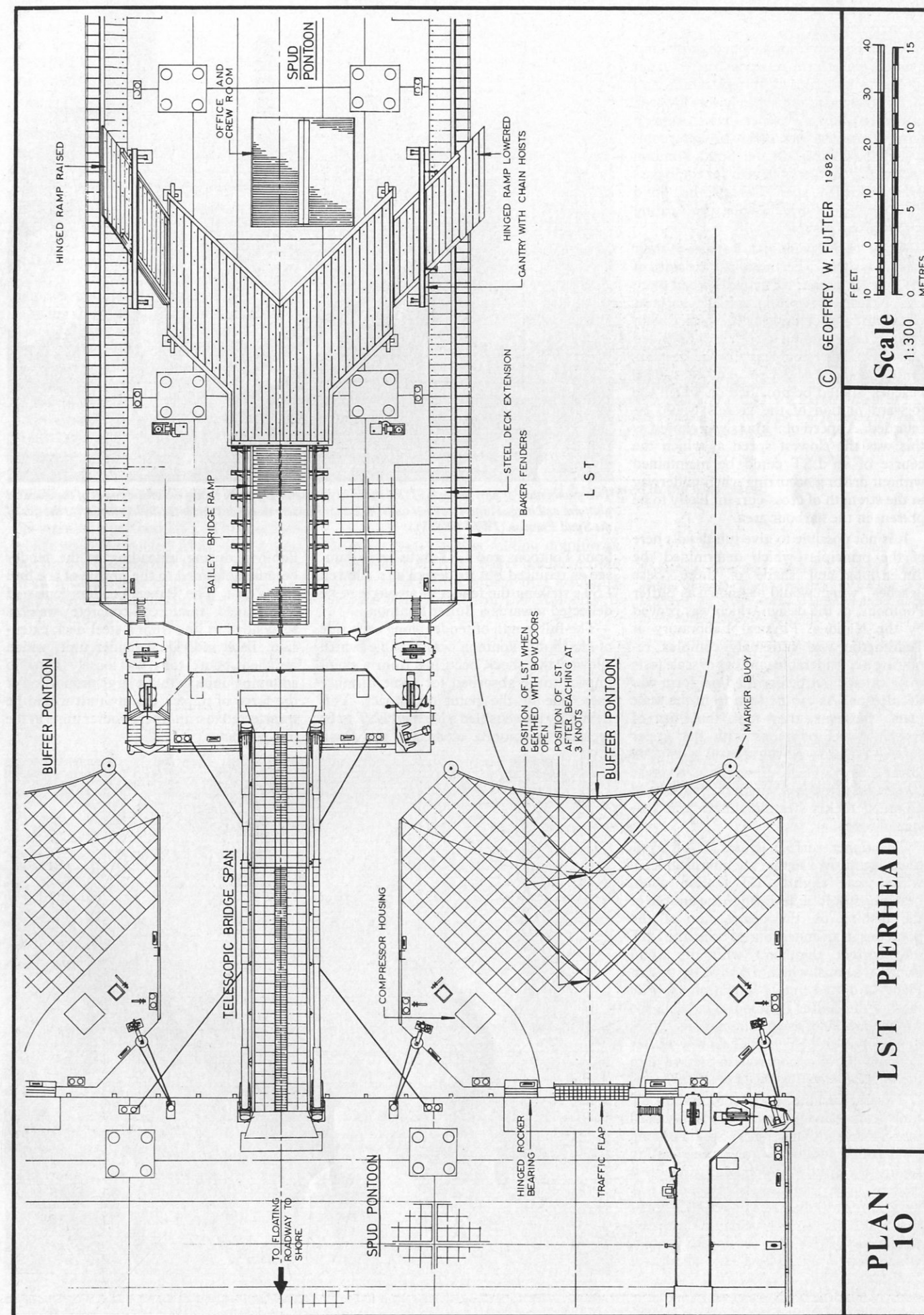
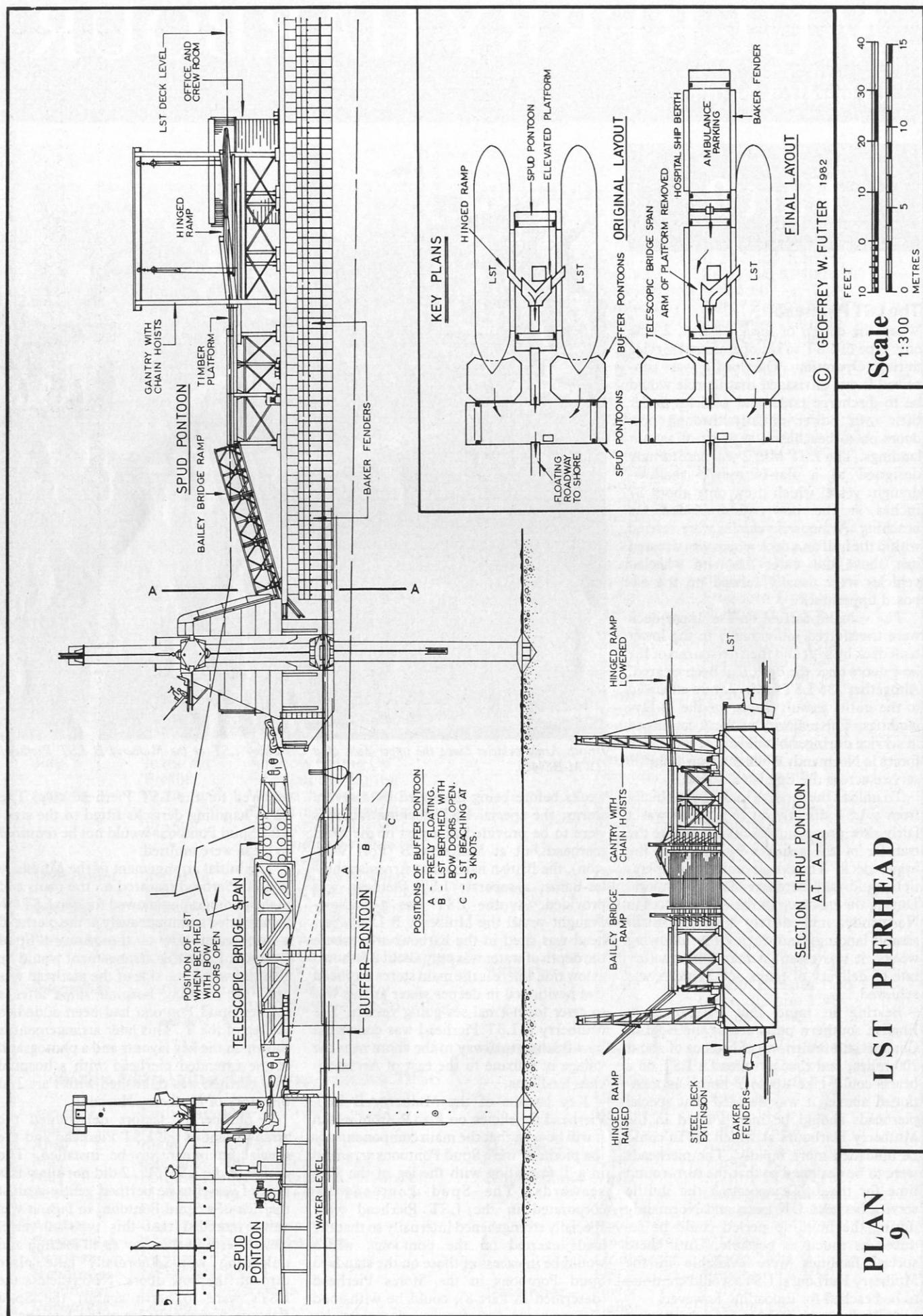
weeks before being destroyed by a severe storm, the special LST docking facilities were to be provided as a part of the main pierhead but at Mulberry B (Port Winston), the British harbour at Arromanches-les-Bains, a separate LST Pierhead was provided. As the LST was a shallow-draught vessel the Mulberry B LST Pierhead was sited in the harbour area where the depth of water was only about 2 fathoms at low tide whereas the main stores pierhead was positioned in deeper water as this was to cater for normal sea-going vessels. The Mulberry B LST Pierhead was connected by a floating roadway to the shore near the village of Cabane to the east of Arromanches-les-Bains.

Key layouts of the Mulberry B LST Pierhead are shown on Plan 9, from which it will be seen that the main components for the pierhead were Spud Pontoons arranged in a T formation with the leg of the T to seawards. The Spud Pontoons incorporated in the LST Pierhead were specially strengthened internally so that the loads exerted on the pontoons, which would be in excess of those on the standard Spud Pontoons in the Stores Pierhead (described in Part 8), could be withstood without harm. Attachment points were also fitted for the fixing of the special equipment

required for the LST Pierhead role. The cargo handling derricks fitted to the standard Spud Pontoons would not be required so these were omitted.

The initial arrangement of the Mulberry B LST Pierhead featured on the plans and in the photographs allowed for two LSTs to be unloaded simultaneously at the pierhead — one each side of the seaward Spud Pontoon. Later this arrangement would be changed when one side of the pierhead was used for berthing hospital ships after a further Spud Pontoon had been added to the leg of the T. This later arrangement is shown on the key layouts and a photograph of the extended pierhead with a hospital ship berthed was published with Part 2 of this story of Mulberry Harbour.

A number of factors determined the arrangement of the LST Pierhead and the special equipment to be installed. The design of the LST Mk. 2 did not allow this type of vessel to be berthed gently against the side of a Spud Pontoon, in fact, it was never intended that this type of vessel would berth in this way as all loading and unloading would normally take place through the bow doors. Nevertheless the LSTs were to berth against the Spud Pontoon forming the leg of the T to enable the vehicles carried on the upper decks to



be discharged directly on to an elevated platform fitted on this Spud Pontoon, thereby reducing the total time of unloading considerably.

As can be seen from the photographs and plans this platform was constructed from timber decking carried on steel framing and included hinged ramps which were lowered to rest on the LST upper decks. A steep ramp assembled from Bailey bridging components led down to the Spud Pontoon deck and from there the vehicles could pass over a bridge span linking the Spud Pontoons to be driven along the floating roadway to the shore.

As the LSTs would not, because of their design, be able to berth against the sides of the Spud Pontoon, particularly when there was a cross-current through the harbour area, without being slowly warped into position after coming to rest, it was decided that the LSTs should approach the pierhead at a speed of 3 knots and that 'false beaches' should be provided on which the forward motion of the vessels would be retarded. A speed of 3 knots was chosen as this was the slowest speed at which the course of an LST could be maintained without drifting occurring when underway in the strength of cross-current likely to be present in the harbour area.

It is not possible to give full details here of the principles which determined the dimensions and shape of these 'false beaches', which would be known as Buffer Pontoons, as the design which was proved by the National Physical Laboratory at Teddington was extremely complex requiring a considerable number of scale tests to be carried out before the final form was decided on. As can be seen from the scale plans, however, they took the form of buoyant steel pontoons with the upper surface tapering downwards to a concave leading edge. The Buffer Pontoons were connected to the Spud Pontoon by specially designed rocker bearing hinges and tensioned ropes.

The upper surface of the Buffer Pontoons was dished so that the bow of an LST which was slightly off course when beaching would slide down to the bottom of the dishing on the centre line of the pontoons in an endeavour to bring the LST into correct alignment with the Spud Pontoon against which it was to berth. On Plan 9 a dotted line is shown on the side view of the Buffer Pontoon to indicate the surface profile of the pontoon on its centre line. When a LST beached on a Buffer Pontoon the pontoon was depressed into the water as also illustrated on Plan 9.

To safeguard the Spud Pontoon and LST hulls from damage which could be caused by LSTs heavily striking the Spud Pontoon if berthing obliquely or being swung against the Spud Pontoon in a strong cross current, a special design of fender was devised for installation along both sides of the Spud Pontoon carrying the elevated unloading platform. This special fender, which was developed by A. L. Baker (later Professor A. L. Baker), a Civil Engineer, on behalf of the War Office was unique in many respects. Not only could it protect the

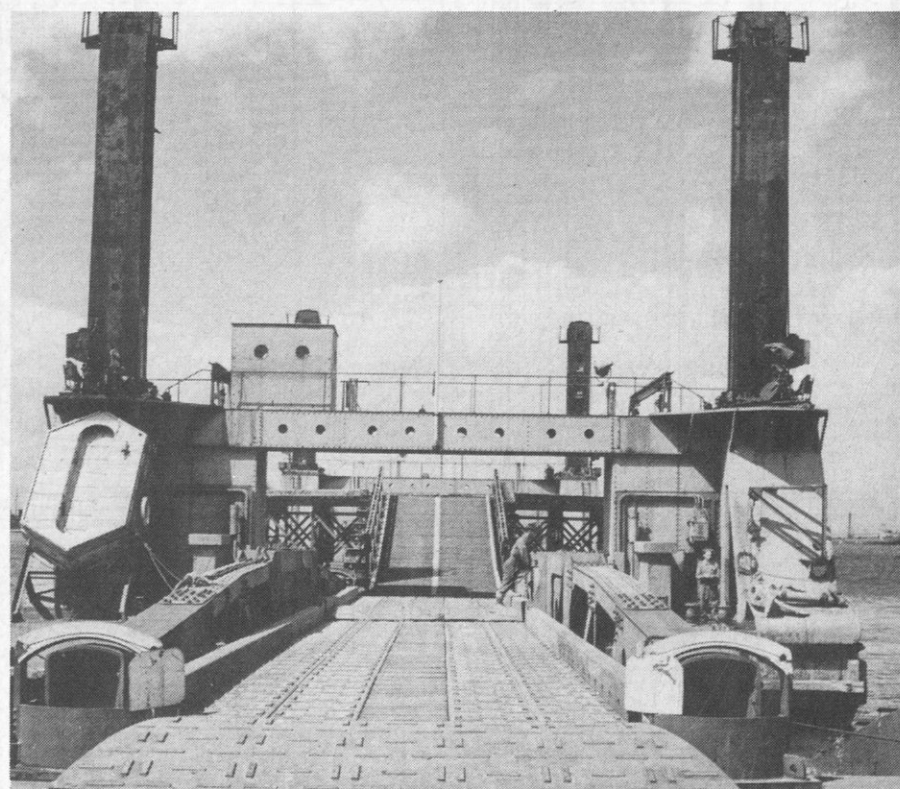


This photograph of part of the LST Pierhead at Mulberry B clearly shows the arrangement of the elevated platform and hinged ramps together with the Baker Fenders suspended under the deck extension at the side of the Spud Pontoon (IWM-B8425).

Spud Pontoons and LST hulls from damage as required but its design also allowed LSTs striking the fender at an angle to be deflected towards a Buffer Pontoon.

The full length of fender along each side of the Spud Pontoon was flexible which allowed the shock occurring from a point impact to be absorbed for some distance each side of the point of impact. This flexibility also enabled a berthed LST to be securely cushioned alongside the Spud

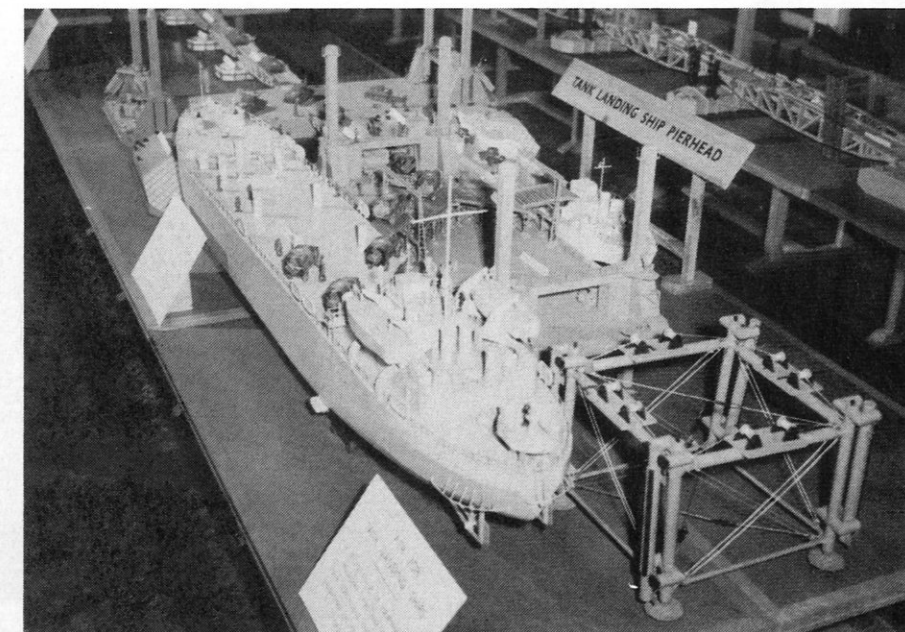
Pontoon during unloading as the fender became deformed to the profile of the hull of the LST. The 'Baker' Fenders consisted of cranked reinforced-concrete weights suspended in line from a steel deck extension. Each individual fender unit, which weighed about 2 tons, was loosely linked to adjoining units so that a large proportion of the force of impact on any unit would be transferred to a number of other units in the line of fender.



A view along the telescopic bridge span linking the two Spud Pontoons of the original LST Pierhead at Mulberry B. The Bailey Bridge ramp can be seen under the bridge of the Spud Pontoon (IWM-B8426).

When struck by a berthing LST the hanging fender units were pushed towards the side of the Spud Pontoon but, due to the heavy weight of the units and their linkage to other units, the shock was rapidly absorbed by the fenders so that damage to the Spud Pontoon plating did not occur. The general arrangement of the 'Baker' Fenders is shown on Plan 9. Although each fender unit weighed as much as 2 tons it was necessary to rigidly secure them when the Spud Pontoon was under tow across the English Channel. This was achieved by drawing the units up to the underside of the deck extension with detachable steel rods which were then bolted to the plating of the deck extension. If the units were not secured, the movement of the Spud Pontoon when under tow could cause the units to swing rhythmically placing unacceptable damaging stresses on the suspension points or the units could swing heavily against the Spud Pontoon and inflict damage to its watertight compartments.

Mr A. L. Baker also devised a folding dolphin to be placed as an extension of the Spud Pontoon forming the leg of the T arrangement of the LST Pierhead. As the hull length of the LST Mk. 2 exceeded the length of this Spud Pontoon the folding dolphin was intended to be used to secure the stern of a berthed LST. This dolphin, which was constructed from steel tubing, was to be transported folded across the English Channel to be unfolded to form a rigid structure standing on the seabed at the LST Pierhead. One of the photographs



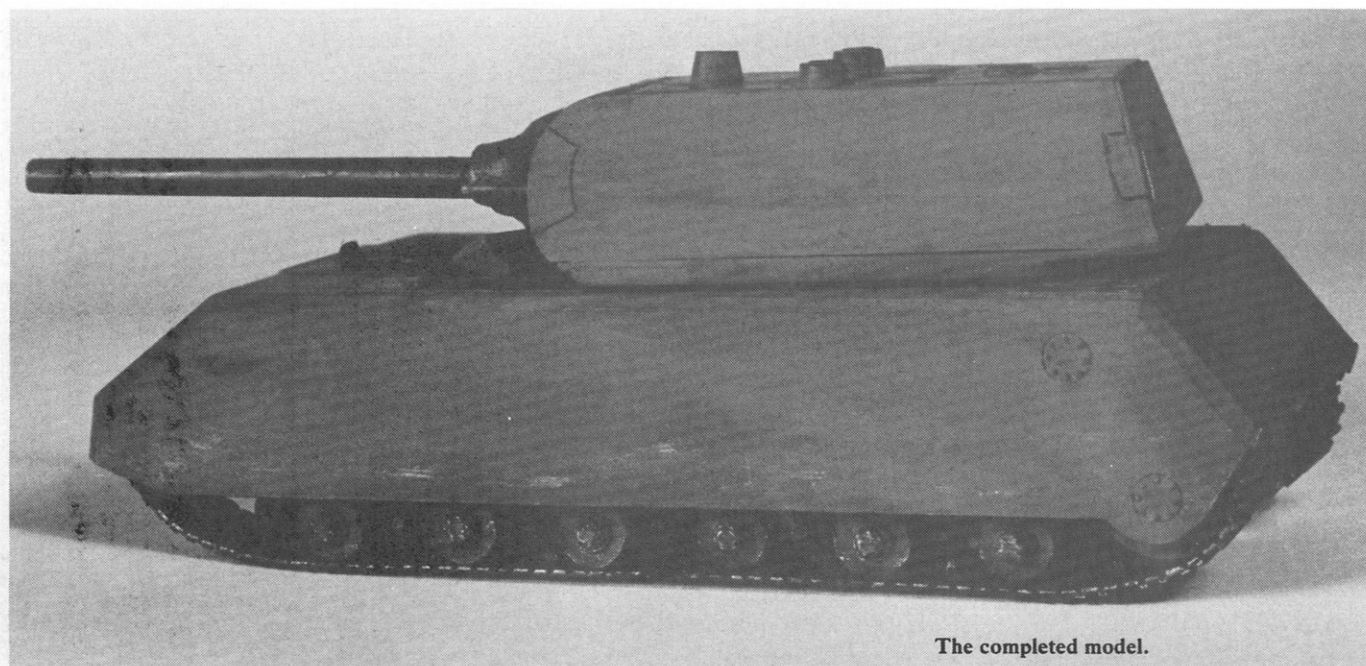
A War Office model (circa 1944) of an LST Pierhead with a model of an LST Mk.2 to the left and an LCT on the right. The device at the stern of the LST is a Baker folding dolphin which was intended to form an extension of the Spud Pontoon to ease the berthing of vessels (IWM-H41648).

Note: Part 8 appeared in the May issue.

shows a model of this folding dolphin as proposed by Mr A. L. Baker but no records appear to exist to confirm that a folding dolphin was installed in the Mulberry B LST Pierhead.

Sherman tanks of the 1st Polish Armoured Division moving along the floating roadway which linked the Mulberry B LST Pierhead to the shore near Cabane in the background (IWM-B8470).





The completed model.

Scratch-built Maus

by W. J. Cane

During 1942 Adolf Hitler asked Dr Ferdinand Porsche, the man responsible for the Volkswagen, to design a super-heavy tank which would outclass all existing or projected vehicles. It was to be a breakthrough tank, armoured to withstand any anti-tank gun and armed with a high velocity 128mm gun. The massively thick armour, up to 350mm, would allow it to function as a mobile bunker to plug gaps in the Atlantic Wall, a project which was uppermost in Hitler's mind at that time.

The tank has always had the popular image of an armoured monster which grinds forward and crushes all opposition with brute force and firepower. It is a natural extension of this idea to conclude that a very large and powerful tank will be correspondingly more effective. In fact, superheavy tanks have always turned out as expensive mistakes; few such designs have left the drawing board and none have seen wide service. A very heavy machine could never be properly mobile on the battlefield and mobility is the essence of armoured warfare, particularly of the brand practiced by the Germans. Under certain circumstances like static defence the superheavy tank might be valuable, but never valuable enough to justify its huge cost. However impracticable the land battleship concept might have been it was bound to appeal to Hitler.

During the first World War the Germans had made the 40 foot long Grosskampfwagen which, with its four 77mm guns, seven machine guns and 32 crewmen tipped the scales at 150 tons. It is doubtful whether this clumsy giant could have been transported to the front; even if it had, the first patch of soft ground would have sealed its

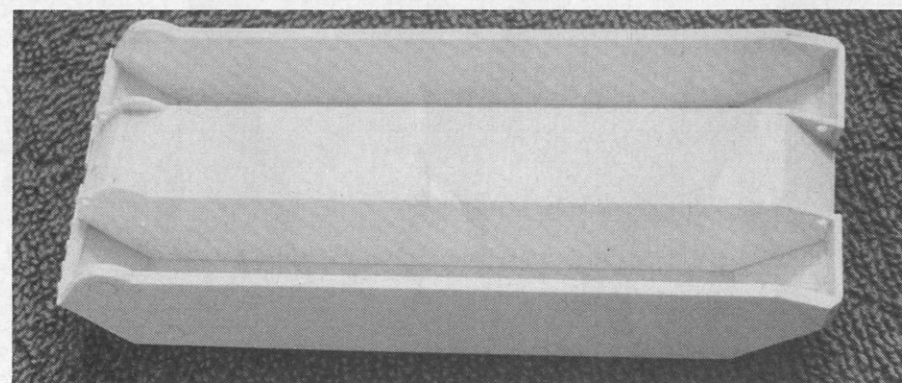
fate. Recovery of a bogged down 150 ton vehicle would scarcely have been possible under Western Front conditions.

By 1942 great strides had been made in the field of automotive engineering and the superheavy tank was perfectly practicable, though still technically difficult. Porsche was probably the best man to produce such a machine; he was a brilliant and original engineer and his designs were crammed with unconventional features but unfortunately the Army was invariably hostile. To them innovative engineering meant unreliability and extra pressure on training and maintenance services and they rejected his designs. In particular, his design for the Tiger tank was turned down because of its unconventional petrol-electric drive and ninety of the partially completed vehicles later ended up as the ill fated Ferdinand tank destroyer. Given the outlandish specifications for the vehicle, Porsche's radical methods of engineering would be an asset.

Porsche began drafting on 4 June 1942. By the end of the year detailed plans were

ready and early in 1943 he presented a model to Hitler. Opposition mounted quickly. The General Staff and HQ Panzer Troops, heavily involved with the invasion of Russia, protested about the great weight. Even if the machine had any tactical value, which they doubted, how could it be transported to the battlefield without severely dislocating road and rail services? The Armaments Minister, Albert Speer, had the near impossible task of rationalising Germany's chaotic war production. He opposed the super-heavy tank project on the grounds that it diverted skilled labour and resources from essential tank production.

General Guderian, the Inspector of Panzer Forces and Germany's leading exponent of armoured tactics recalled in his autobiography a meeting with the Porsche design team at which 'Our discussion grew heated, since everyone present except myself regarded the Maus as a very handsome tank'. He objected to the tank on the simple grounds that it was useless. Naturally these



The basic shell structure.

sensible arguments had no effect on Hitler; he probably dismissed them as mere conservatism. After inspecting the model he asked for the main armament to be uprated to 150mm and placed an order for the first prototypes. There were to be ten prototypes followed by a production run of 152 machines, there is no evidence that a written contract was ever issued.

There were delays caused by difficulty in finding a suitable engine and the need to redesign the turret to accommodate the new armament. Construction work on the first prototype, with a petrol electric drive, began on 1 August 1943. Hedging his bets, Porsche fitted a diesel electric drive in the second prototype on which work began shortly. By Christmas the first prototype was ready for running trials and tests continued until May 1944 when Krupp delivered the first turret. By 9 June less than a week before D-Day, the first Maus was complete.

There was now no question of organising a Maus production programme and further development was shelved. Both prototypes were moved from their testing ground at Boblingen and sent to Kummersdorf where they were eventually blown up to prevent their falling into Russian hands. The Allies found a number of hulls and turrets at the Krupp testing ground near Meppen. From the German point of view it was bad enough that resources had been wasted on one

from the 200mm angled glacis plate to the 40mm belly plate (thicker than the frontal armour on some Panzer IV models) pushed the weight up to about 180 tons. Enormously wide tracks reduced the ground pressure as much as possible and in fact the performance, particularly the turning circle, was surprisingly good on firm ground.

Power came from Porsche's pet 'Mixte' drive, the feature largely responsible for losing him the Tiger project. A 1200hp Daimler Benz petrol engine turned two 400kW, 800 volt generators which powered the two electric motors geared to the rear sprockets. These motors gave a maximum road speed of 12½ mph. There were 48 semi-interleaved steel-rimmed wheels coil sprung in groups of four on twelve bogies. In addition to the coil springing each bogie was sprung by longitudinal torsion bar.

The 50 ton turret could be traversed through 360 degrees in 16 seconds by an electric drive and mounted a 150mm KwK 44 as main armament, with a co-axial 75mm gun. One co-axial machine gun and one anti-aircraft machine gun were planned and close-in defence was provided by a grenade launcher in the turret roof. Because the 150mm round proved to be very heavy a crane was provided to assist in loading.

The great weight of the Maus would have prevented it from crossing most bridges, so deep wading was an essential feature. The hull was waterproofed giving wading up to

Now glue the two bulkheads (template E) into the positions shown on template A. Referring carefully to the plans, fix the turret top plate (template F) on top of the bulkheads. When the assembly has set, glue on the turret sides (template C) and the rear (template D).

File and sand the bottom of the turret to its correct curved section using the side and front views of the plan as a guide. The curved front of the turret is made from block balsawood, cut to fit into the front of the assembly then sanded into shape and sealed with varnish. Fill all cracks in the assembly with body putty and when dry rub it gently down with wet and dry paper.

Details on the top and rear plates can be made up with bits from the scrapbox or from around the house and the weld marks on the armour scribed in with the end of a rat tail file. My gun mantlet was made from balsa, carved and sanded into shape, then sealed with varnish and rubbed down to a smooth finish. The gun came from an old 1:35 scale tank gun but suitably filed sprue would probably do the job just as well. I pinned the gun right through the mantlet and fixed it firmly into the turret.

Hull

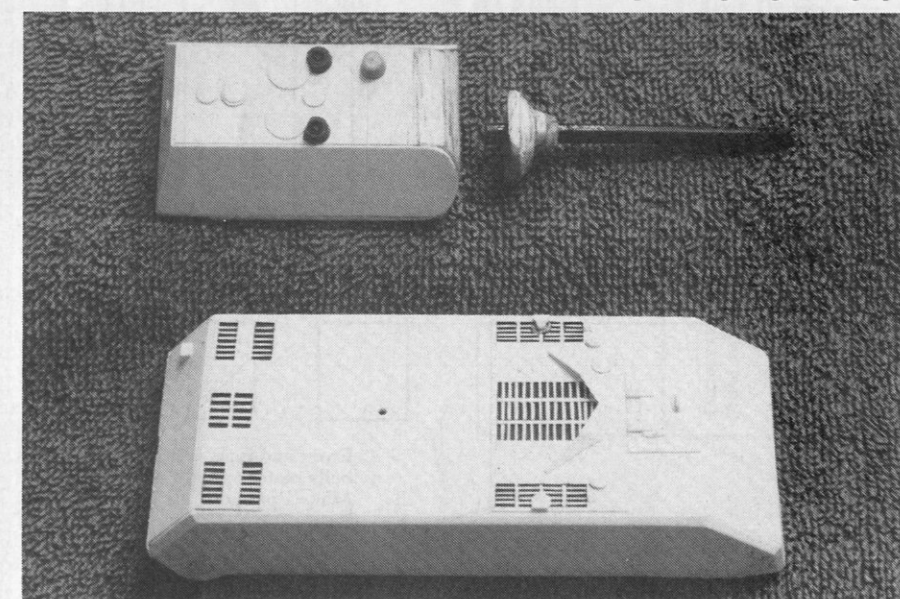
The massively thick side armour is made from two laminated pieces of 40 thou plastic card and requires 4 parts made up using template G. On my first attempt I tried using one layer of 70 thou but after difficulties in cutting it accurately I went over to laminating 40 thou.

Cut out the hull top from template H, drill out the hole in the position marked and then glue on the hull sides. From templates I and J make up the inner hull sides and the belly armour formers and laminate them, taking care that on each side the belly armour former is on the inside.

Add the glacis plate (template K) and the rear plate (template L). Now cement the inner hull sides into position beneath the hull top using drawing M as a guide and add the belly plate from template N. Cut out and add the following parts:- the front and rear belly plates from templates O and P, the rear plate edge from template Q and the front end plates from template R.

The edges of the hull armour must now be chamfered off at 45 degrees to vertical (see front view of plan). Since an error in this operation will mean a return to start it's worth taking a bit of time over it. I pinned a sheet of medium grade sandpaper on to a flat block of wood and holding the model at 45 degrees to the block, rubbed it gently up and down. There is a tendency, which has to be avoided, for a rocking action to set in, resulting in an unwelcome curve on the edge.

Rather than try to scribe the hull top detail directly on to the model I built it up to 10 thou plastic card and then fitted the whole lot on in sections. The small shield on the hull top (which I assume was intended to protect the relatively vulnerable grille from shells bouncing down from the mantlet) can be made up using template S. The various other small details on the hull should now be added.



A stage further on in the construction.

superheavy tank; in fact, following the usual German practice of setting up opposition projects to stimulate competition, the E-100 was designed. This was a scaled up Tiger II with the same main armament as the Maus, but less heavily armoured and lighter by some 40 tons. The name E-100 came from the projected E series of armoured vehicles, a system intended to rationalise spare parts interchangeability and reduce the number of types in service. No other E series vehicles were made and only two E-100 prototypes were partially completed.

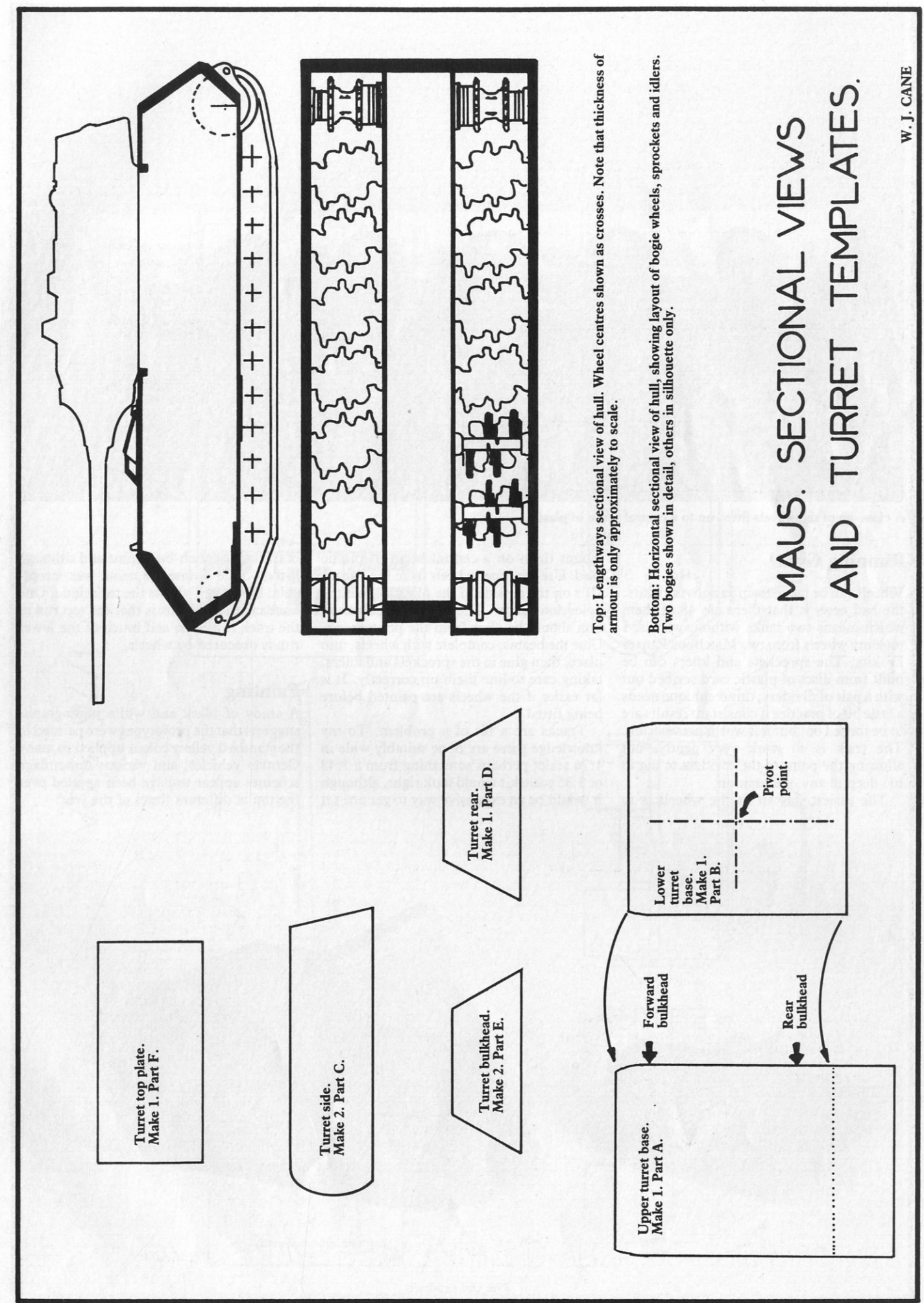
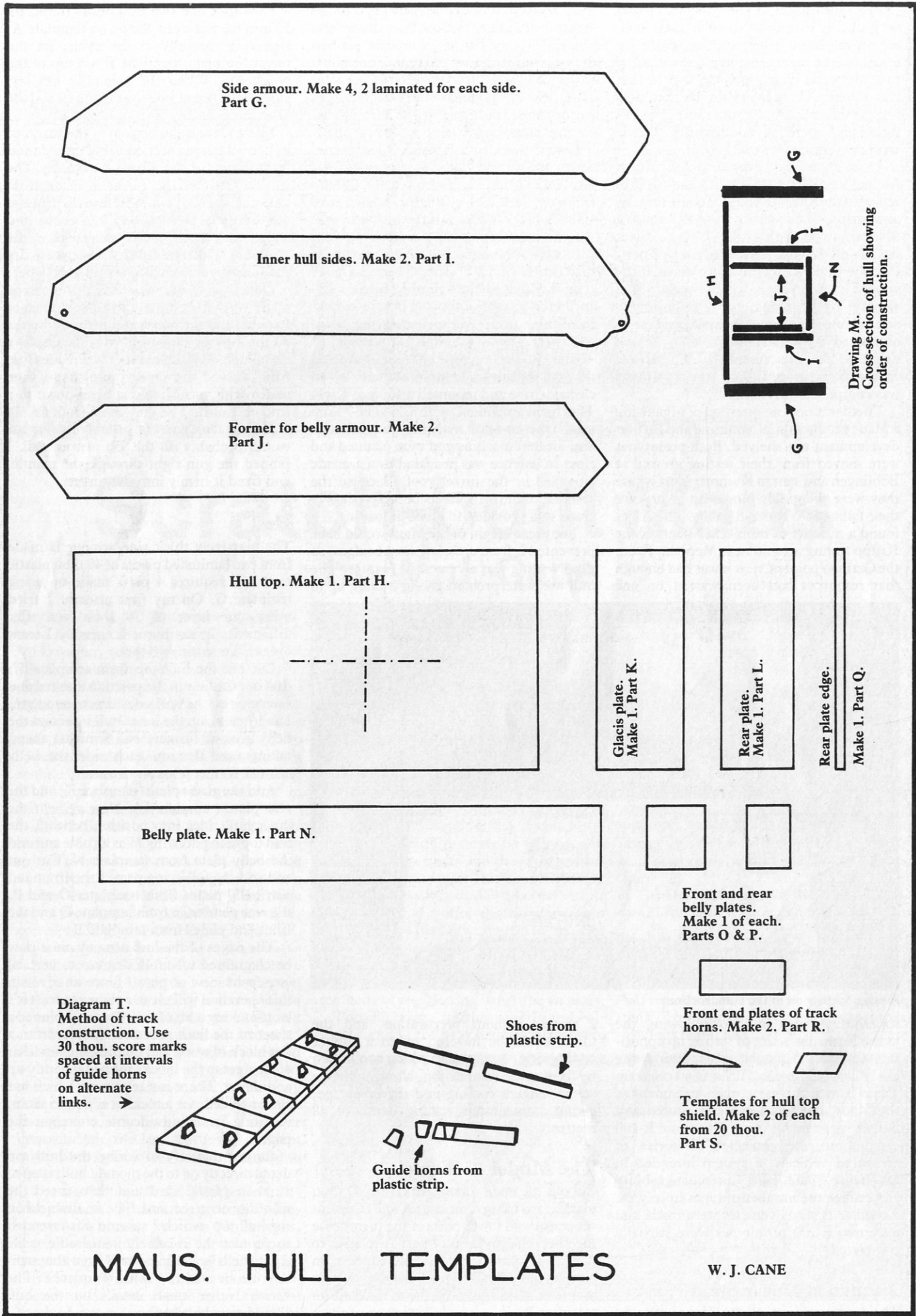
Technical Description

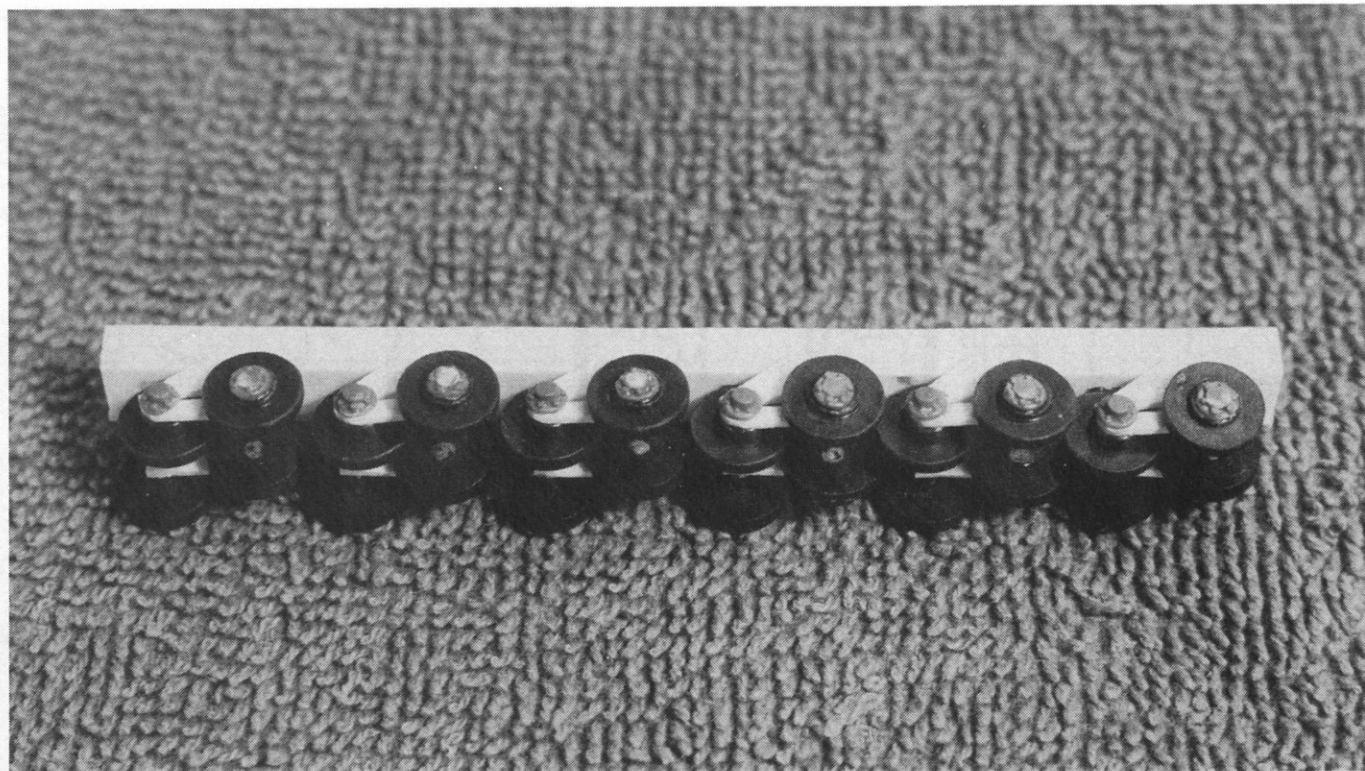
The heavy armour of the Maus, ranging

2 metres without preparation, and the turret could be lowered on to a rubber sealing ring. A canvas trunking could then be fixed to the vehicle top, allowing intake of air, engine cooling and driver escape, giving a maximum wading depth of 28 metres.

The Model — Turret

Cut out the main turret parts from 40 thou plastic card using templates A to F. Cement the upper and lower parts of the turret base together, the position of part A relative to part B is shown by the dotted line on template A. Drill a hole of about 2mm diameter at the pivot point as marked on template B.





A close-up of the wheels fitted on to a central beam of plastic.

Running Gear

Wheels can be taken from various tank kits: the bad news is that there are 48 of them which means two tanks without wheels. I took my wheels from two Matchbox Panzer IV kits. The sprockets and idlers can be built from discs of plastic card scribed out with a pair of dividers; this technique needs a little bit of practice if consistent results are to be turned out but it is worth persevering. The trick is to work very gently, not allowing the point of the dividers to dig in too deep in any one rotation.

The easiest way to fit the wheels is to

mount them on a central beam of plastic card. Use the inner wheels from the Panzer III's on the outside of the Maus so that the holes don't show. The method of construction should be clear from the photograph. Glue the beams, complete with wheels, into place, then glue in the sprockets and idlers, taking care to line them up correctly. It is far easier if the wheels are painted before being fitted.

Tracks are a bit of a problem. To my knowledge there are none suitably wide in 1:76 scale; perhaps something from a 1:48 or 1:35 scale kit would look right, although it would be an expensive way to get one set

of tracks. I scratch-built mine and although it took quite a time the result was acceptable. Diagram T shows the technique. One bonus with the Maus is that the top run of the track is hidden and much of the lower run is obscured by wheels.

Painting

A study of black and white photographs suggests that the prototypes were painted in the standard yellow colour applied to many German vehicles, and various camouflage schemes appear to have been applied over the top at different times of the year.

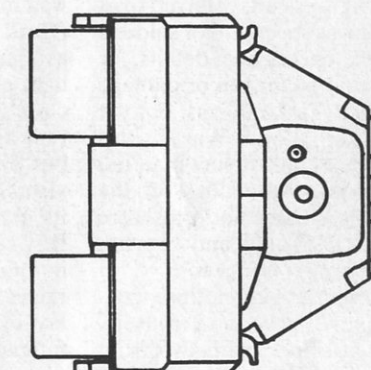
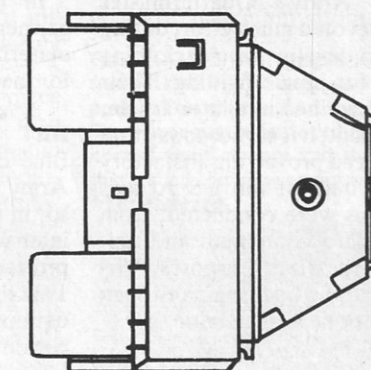
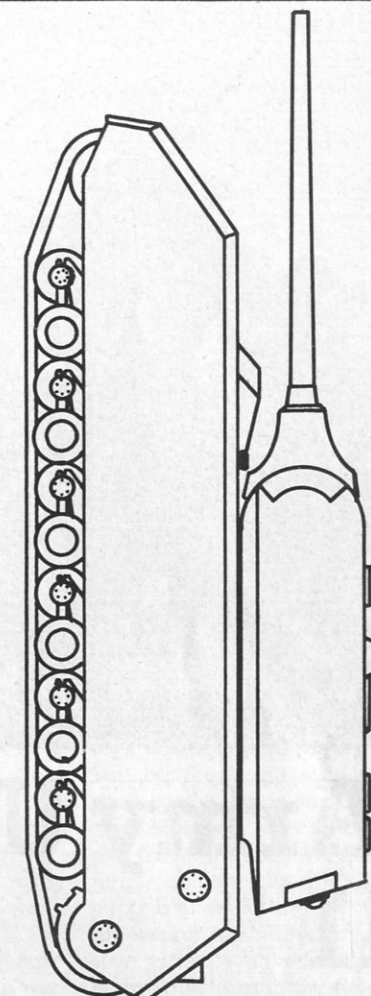
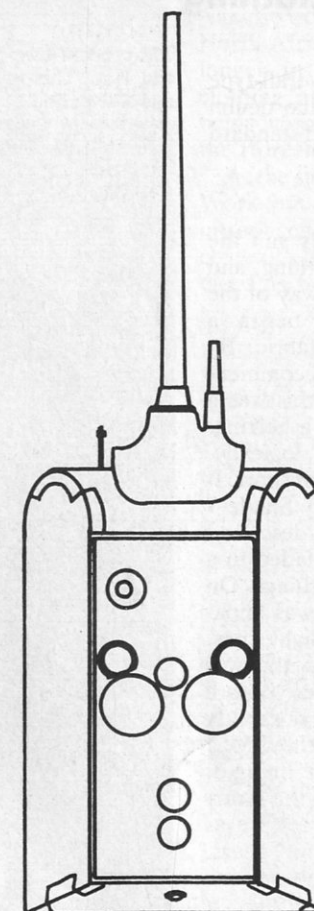
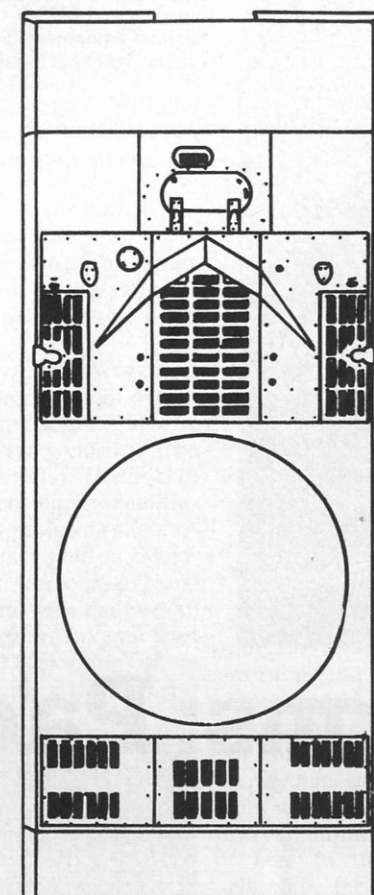


The end product.

PZKW MAUS

1/76 SCALE

W.J. CANE





Pacific Combat Dress (I). US Infantry advance in Northern Luzon, supported by M7 GMCs in March, 1945. The leading soldier wears Two-piece HBT Work Suit and leggings. The man behind him wears M1942 HBT Fatigues and M1943 Combat Boots. Note the minimal equipment. Second soldier is using a Lightweight Gas Mask Carrier as a musette.

US Army Uniforms: Pacific 1941

Lee Russell continues his series with Fatigue clothing

As previously mentioned (see May 1982 issue) the US Army's Quartermaster Corps (QMC) devoted much effort during World War II to develop special clothing and equipment for jungle fighting. Their efforts will be described in a later article, but, for the moment, it is suffice to say that what they produced proved unsatisfactory in service. The bulk of the US Army's Pacific campaigns were conducted, from 1942, with standard equipment and uniforms intended for other purposes. Virtually all this clothing had originally been procured for work or fatigue issue.

Pre-war Fatigue Clothing

Before World War II, one of the Army's standard orders of dress was referred to as Fatigue Dress. It was specified for soldiers engaged in work or kitchen details, or during training that might soil or damage their expensive Service Uniforms. For the twenty years after World War I, this clothing was made of blue denim material in two basic styles, depending on the duties of the soldier. These uniforms were for Enlisted Men (EM) only, and were not intended to be worn by Officers.

For most troops, fatigue clothing consisted of a baggy cut jacket and trousers. The jacket was provided with two front pockets at the waist. The trousers were of standard cut, with concealed side pockets and patch rear ones. A blue denim work hat was also provided, of simple construc-

tion with an all-round brim.

In the early 1930s, a coverall-type garment, made in the same blue denim material, was adopted as limited standard for mechanics and chauffeurs.

HBT

Blue denim did not particularly suit the Army in the role of fatigue clothing, and so, in the slow cost-conscious way of the inter-war period, the QMC began a protracted search for a new fabric. By 1937 they were ready to make recommendations on a new material — this was a cotton Twill, manufactured in a herringbone weave pattern and known, logically, as Herringbone Twill, or HBT for short. It was made for fatigues in Army Shade 7 (Dark Green), which might be described as a greenish-olive. It quickly faded to a light grey-green with a few washings. On close examination, the weave was apparent as a pattern of dark and light lines, but from even a few feet away, this was virtually invisible to an observer. Before its qualities of toughness and durability first attracted the attention of the QMC, its primary use had been in the lining of raincoats. After its adoption by the Army however, it was to remain in service as fatigue clothing for the next twenty years, and even saw service with the Marine Corps from 1941 until the mid-1960s. It had originally been planned for HBT to replace blue denim in all types of work

The pre-war Two-piece Blue Denim Work Suit and Hat. This uniform saw service into the mid-war period.

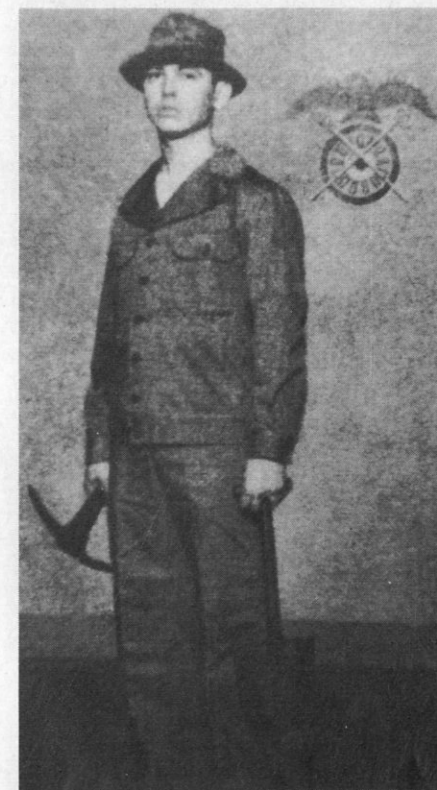


clothing but the rapid expansion of the prewar Army required continued issue of the old fatigues for some time. The denim coveralls, never popular, vanished first, but the two-piece uniform remained in issue in the 'States until mid-war, generally for the dirtier sort of details. These suits were also worn as combat dress in the Philippines by the Philippine National Army in 1941-42 due to having been issued from US Army surplus stocks still held in the Islands.

The two-piece HBT work suit

After the QMC's decision on a fabric, they next undertook revision of the styles of both denim coveralls and the two-piece suit.

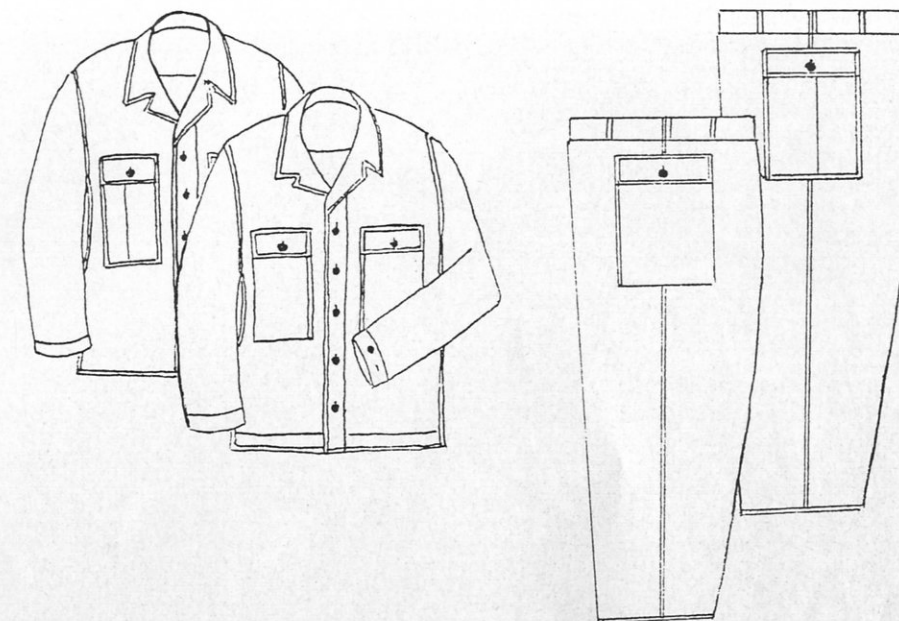
In style, the new two-piece Work Suit was very different from its denim predecessor. The jacket was made in a coat style with cuffs in a shirt-type closure (the denim jacket had plain cuffs). The pocket arrangement was revised, with two centre-pleated breast pockets replacing the earlier pattern. The jacket had a band-finished bottom, which led to an unusual arrangement of buttons, with the bottom two set very close together. Like all later buttons on Army HBT clothing, these were of black metal with a thirteen-star design.



The complete HBT Two-piece Work Suit, with band finished hem to jacket and HBT 'Daisy Mae' Work Hat. Shovel in soldier's left hand is the M1910 Entrenching Shovel, an oversized example of which can be found in the Airfix US Marine Multipose set.

Trousers were made in the same style as the khaki trousers, with normal (concealed) side and rear pockets.

An HBT Work Hat, styled like the old denim model, was also issued for wear with this uniform. Troops quickly dubbed it the 'Daisy Mae Hat' after a vaguely



The M1942 HBT Fatigues. In front is the 'First Pattern', the most commonly worn. To the rear, the 'Modified Pattern' is shown with pleated pockets to Jacket and Trousers. These were less commonly seen.

similar design worn by a popular comic strip character. The hat was not too popular in the 'States, but was widely worn in the jungle campaigns of New Guinea and Burma. Many were also issued to the US Marines, with the badge of that Corps stencilled on the front. Army hats were plain, and could be worn in a variety of ways, most of which were very unmilitary in appearance!

Due to the lack of suitable jungle clothing, the two-piece Work Suit was used for this purpose until mid-1943. It was also worn briefly as combat clothing in North Africa. The uniform survived even longer in its original role as fatigue clothing, and I have seen photos of it still being worn (by a Colonel, no less) during the Korean Conflict!

At the same time as the HBT two-piece Work Suit entered service, the QMC also introduced a replacement for the denim coveralls. This garment was later standardized as the HBT Mechanics Coveralls,

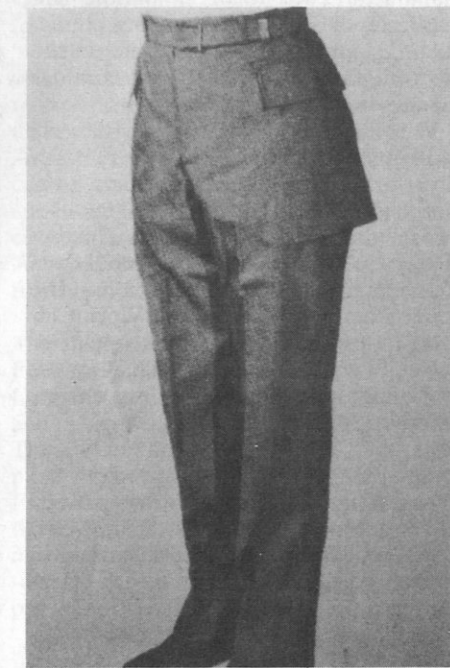


and was described in the May, 1980 issue of *Airfix*. The HBT Coveralls may be regarded as contemporary with the Work Suit, but the design owed little to its denim predecessor, being copied instead from a different Air Corps model. The Mechanics Coveralls also saw use as fatigue and jungle combat clothing. They were less popular in the latter role, as they required the wearer to remove his equipment and strip virtually naked to attend to major bodily functions in the field.

The 1943 two-piece HBT fatigues

Until mid-1942, the pressure on the QMC had been to meet the often conflicting goals of maximum production and the

Official QMC photographs of the 'First Pattern' M1942 HBT fatigues, with the odd 'bell pockets' on shirt and trousers. Also note the Gas Flap counter-buttoned across beneath the normal front closure and the Anti-Gas cuffs that pulled the sleeves tight against the wrist when fastened.





The M1942 HBT Fatigues in service. On the left, worn by Major-General Verne D. Mudge (1st Cavalry Division's commander until wounded in action in Luzon) with jacket tucked into trousers. The general wears a .45 automatic in a shoulder holster and pistol belt with canteen and .45 ammunition pouch. On the right, two of his soldiers, relaxing after the capture of Manila, wear their fatigues in the more usual manner, with jacket outside trousers, HBT Caps and a minimum of web gear. Note anti-gas cuffs worn unfastened and loose in both photos. Both the general and his men have removed the uncomfortable gas flap from their jackets.

development of clothing for special troops. By that time, however, a new constraint had arisen. This was the problem, faced by all the belligerent powers, of conserving material and manufacturing resources during the period of wartime shortages. For the QMC, this meant going back to evaluate all items in production. Manufacture was to be simplified, and duplicate or unnecessary items eliminated. As part of this programme, in the Fall of 1942, a committee met to consider changes in the HBT uniforms.

The most serious problem with the early garments was that, while they were basically work clothing, both one and two-piece HBT fatigues incorporated features whose intricacy required special manufacture. It was resolved to simplify the garments so that their production could be undertaken by the American Work Clothing Industry, until then relatively uninvolved in war work. This would allow the specialized manufacturers to concentrate on other items.

At the same time, in an ambitious programme, the new HBT garments were to be made suitable, not only for work and training, but for protection against chemical attack. Jungle combat was not a primary consideration, but, like the HBT garments they would replace, the new clothing was expected to be used in this role pending development of a more

suitable jungle uniform.

The QMC Committee's recommendations were standardized and placed into production in February, 1943. The M1943 Armoured Force Coveralls replaced the earlier model in production (see May, 1980 *Airfix*), and were quite successful in service. The two-piece uniform was a different story. Here, the committee's recommendations had produced a very strange garment indeed!

As finally produced, the simplified M1943 Two-Piece HBT Fatigues had several odd features. The jacket, as compared to the earlier Work Jacket, was made longer, so it could be worn either loose or tucked inside the trousers. The shirt-type pockets were replaced by huge rectangular cargo pockets, each closed by a single metal button. Their large size was determined by the size of a standard Army K-Ration box. An anti-gas flap was provided to counterbutton beneath the front closure and an awkward anti-gas cuff replaced the shirt-type cuff of the Work Jacket. Extra buttons beneath the collar allowed the attachment of a protective hood, which was in fact never issued, leaving a generation of soldiers wondering what the odd buttons were for!

The Trousers were stranger still. Instead of normal side pockets, they had instead two further Cargo ones, the same style as those of the Jacket. These pockets

were to prove a source of constant complaint from the users. They were inconvenient and hard to get into, and any item placed inside tended to flop around within. This was really too bad, since no rear pockets of any kind were provided!

Chemical protection was to be accomplished through impregnating the fabric in the field. Special Quartermaster units were set up to perform this mission, but in the end, few garments were treated in this way. The units were designated Chemical Impregnation Companies, which caused some embarrassment particularly after they were billeted near WAAC Training Centers in the US so they were later redesignated.

In service, the HBT Fatigues were not very popular, and, just a few weeks after the contracts were let, some slight changes to the pockets and the Jacket's back were authorized. However the changes were optional with the manufacturers and few bothered to switch over to the new style. The modified garments, with centre-pleated Cargo pockets, remained quite rare. The regular HBT Fatigues, though, rapidly became the standard combat dress for the Pacific. The uniform also saw use in Italy and NW Europe (although not much as its colour resembled that of certain German uniforms, resulting in obvious problems). It was to remain the Army's standard fatigue uniform until the

mid-1950s, never much liked by its wearers.

Like all Army HBT clothing it proved to be slow drying and heavy when wet. The QMC also turned out to have made a serious error in the sizing of the garments. The M1943 Fatigues were purposely made two sizes larger to allow for shrinkage. The garments actually shrank about one size, thus leaving the disgusted GI with a baggy and oversized fit. Those Army troops stationed near Marine units often traded for the better styled Marine Corps utilities. For their part, the Marines were happy to get the Army M1943 Combat Boots to replace their awkward leggings. Anti-gas flaps were cut from the Army fatigues whenever possible.

Issued along with the new HBT uniform was the new M1943 HBT Cap. It was based on a style worn by civilian railroad workers and proved more popular than the 'Daisy Mae' hat, although it never completely replaced it until after the war.

The M1945 Jungle Fatigues

The last item developed by the QMC in World War II, the M1945 Jungle Combat Uniform saw little actual service. It did not come out of the Fatigue Dress programme, but out of a related effort to develop specialised items for Jungle Combat. As such, it properly belongs with the third part of this article, but, for reasons that will become apparent, I feel it is more proper to include it here.

Earlier Jungle Combat Uniforms had been made in camouflage colours. By mid-war, a decision had been made to manufacture all subsequent garments in Army Shade 7, Dark Green. In August, 1943, the QMC began work on the uniform itself. By then, the problems of HBT fabric were known and the QMC had a file full of complaints from troops about the style of the garments themselves. Wartime production was sorting



itself out and it seemed that little stood in the way of speedy development of a new uniform. In fact, the decision on colour was only the beginning.

The first question to be examined was the choice of a replacement fabric. Test lots of uniforms were made up and subjected to laboratory tests at Ft Lee, Virginia, and to troop trials in the Florida Everglades. The testers unanimously agreed that cotton poplin gave the best results, in terms of weight, drying time when wet and superior insect protection. However poplin production was in short supply, and mostly earmarked for winter clothing, due to its qualities of wind-resistance. The QMC, however, managed to obtain enough for another test lot of garments and shipped them off for issue to the 37th Infantry Division on Bougainville during the period July-November, 1944. Along with them went an equal number of similarly-styled HBT uniforms for comparison. Possibly the QMC was hoping that the new pattern HBT uniform would prove adequate, since the fabric was already in production and there was still no way of increasing poplin production. They might have saved themselves the trouble. The troops clearly preferred the scarce fabric to HBT.

Since nothing could be done about the poplin shortage, yet another round of tests were ordered and a third batch of uniforms, this time with many style changes and still further fabrics for comparison was ordered. These were tested by the 41st Infantry Division on Biak, and, in the 'States, at Camp Indian Bay, Florida, during the Summer and Fall of 1944. The results were as expected, the troops still wanted the unavailable poplin uniforms. However some positive results were obtained by finalizing the style of the M1945 clothing.

An interim variant of the M1945 Jungle Fatigues, ancestor of the modern US field uniform. The M1945 uniform was manufactured in small numbers and there were wide variations between batches.



Pacific Combat Dress (II) Brigadier-General William C. Chase (right, hands on hips) and officers of the 1st Cavalry Division inspect Japanese prisoners taken in the Admiralty Islands fighting in March, 1944. The General and most of the others wear One-piece HBT Mechanic's Suits and HBT Caps. Officer on extreme left of photo wears the Two-piece HBT Work Suit with khaki leggings. General Chase is wearing pre-war private purchase Officer's Field Boots with buckled tops. All officers have removed rank insignia in the field.

It was to be a single-breasted jacket, with two breast patch pockets and a one-piece back. Pocket buttons were concealed, and it was decided to retain the much disliked gas flap in front. The trouser pattern reverted to that of the old HBT Work Suit trousers, but with patch pockets at side and rear, simplifying manufacture. After much thought, it was decided not to provide cargo pockets for the trousers. Actual production, however, had to wait the availability of fabric, which was to be expected with the end of the European War's last winter. In July, 1945, the QMC at last ordered the M1945 Combat Dress into production. There was one final change. At the last minute it was decided to substitute Oxford Cloth, formerly used for Field Jackets and Trousers, for poplin!

Contracts for over 100,000 uniforms were quickly let and as quickly cancelled as the Pacific War ended in two moments of atomic fire in mid-August. Few garments were actually produced and fewer still saw use in the post-war Army. The HBT fatigues were still in inventory overseas and the few M1945 uniforms on hand in the 'States were issued to one battalion of paratroops of the 82nd Airborne Division. The unit was ordered to report on their suitability *vis-a-vis* the HBT fatigues! The results were as predicted, there was no money in the post-war Army to buy more uniforms and the study joined the others in some dusty QMC file cabinet. The Korean War was fought in HBT.

However the M1945 uniform had a comeback. In 1956, with the anti-gas flap removed and the concealed button feature deleted, the garment came back as the Army's new OG 107 Fatigues in yet a new cotton material. Today, made in wash-and-wear fabrics since 1972; the style is current issue for male soldiers in non-Airborne units. World War II's research finally paid off in spades!

Modelling World War II Fatigue Uniforms

One of Airfix's first ventures in 'soft' 54mm figures was a set of US Infantry. These should still be available, and are moulded in correctly styled M1942 HBT Fatigues, with correct equipment. For those who do not wish to work with this material, either the Airfix Multipose or the Italeri US Marines can be employed.

The Airfix Multipose figures are virtually correct for the Two-Piece Work

Suit, but the Jacket needs to be extended a bit below the waist. If equipment is worn this wouldn't show except perhaps in the back. For the M1942 Fatigues, the breast pocket must be greatly enlarged and cargo pockets added to the trousers. If the jacket is depicted worn outside the trousers (as it most commonly was) then it, too must be extended down. This can be easily done with plastic putty. I used an American product for this, called E-POX-E Ribbon, but I understand there is a similar British product called Miliput. Both were originally intended for plumbing repair. I have however, been cautioned by a friend who made extensive use of this material who then developed a skin allergy to them. I therefore recommend following the manufacturer's instructions and use liberal amounts of soap and water after working with the product.

The 'Daisy Mae' HBT Hat is provided in the Airfix Marine Multipose set, and the HBT 'Locomotive' Cap can be made from an Afrika Korps *feldmütze*, with a radically cut back brim and flattened top. The Army made up some helmet camouflage covers, but I've never seen any in photographs outside of training in the 'States. Occasionally, troops painted their helmets in camouflage, but most commonly they were worn bare, in standard OD. Occasionally, a very open-mesh netting was worn.

The Italeri Marines need modification along the lines of the above, except that the jacket is already the correct length. The pockets can be converted to the Army style. Airfix helmets, weapons and accoutrements will help their appearance considerably. The figures are wearing the correct footwear for most of the Pacific War, shoes and leggings, but for the Airfix figures this will have to be built up. Leggings were often discarded in the field. Late in the war, M1943 Combat Boots were issued. These can be made by adding a 3mm strip of paper around the top of the Airfix Boot. If it is desired to model the 11th Airborne Division, the Airfix Jump Boots can be left as they are, although M1943 Combat Boots were more common with this unit.

All World War II American footwear was made in Army Russet, a reddish-brown colour. The M1943 Boots were originally a pinkish tan when issued, but were usually treated with shoe polish by the wearer until they reached an approximation of the 'official' colour.

If anyone desires to depict the pre-war blue denim work uniform, or the experimental M1945 Jungle Combat Dress (of which, remember, only a thousand or so were made), they can follow the usual practice of removing unwanted details with a knife, and adding correct ones with putty and paper.

Field Equipment in the Pacific Theatre

After the initial campaigns, most Army troops travelled light, with only basic web gear and packs. These would have been the M1936 Field Bag for Officers and the



Pacific Combat Dress (II) Anti-aircraft machine-gunners dig in their .50 cal weapon with its oversized magazine and high-angle mount. (All supplied by Tamiya in 1:35 scale in their American Heavy Weapons set by the way). The crew wear (left) the Two-piece HBT Work Suit and (right) the One-piece HBT Mechanic's Coveralls. Headgear is a mixture of HBT Caps and 'Daisy Mae' Work Hats.



Pacific Combat Dress (III). This photo clearly illustrates the diversity of field uniforms in the Pacific Theatre. These men, all from the same unit of the 1st Cavalry Division, inspect a Japanese sword captured in bitter fighting in the Admiralty Campaign. Man on the left wears M1942 HBT Fatigues, with gas flap cut out and a bandana as headgear. Soldier in the centre, a Major, wears One-piece HBT Mechanic's Coveralls and HBT Cap. Man on the right wears the same cap with Two-piece HBT Work Suit.

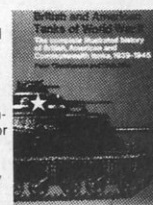
M1910 Light Pack for Enlisted Men. Officers tried to look as much like troops as possible, so the M1910 was more common. Often, even the pack was discarded. Riflemen would often chose to carry their ammunition in cotton bandoliers, acquire a Pistol Belt to replace the M1910 Cartridge Belt, and go into combat with only shovel, two canteens, first-aid pouch and a knife. The M1942 Bayonet

was often left behind and the wearing of suspenders (braces) seemed to be optional with the individual soldier.

All photographs are US Army official.

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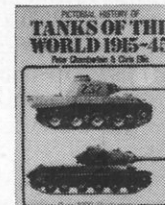
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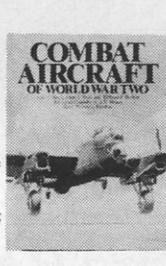


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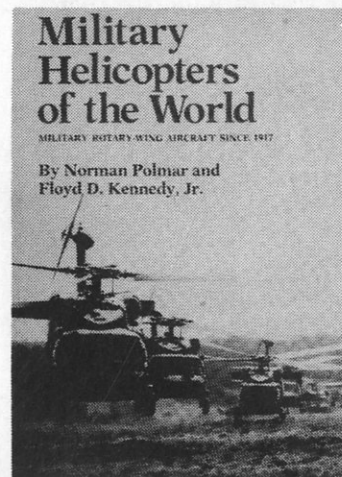
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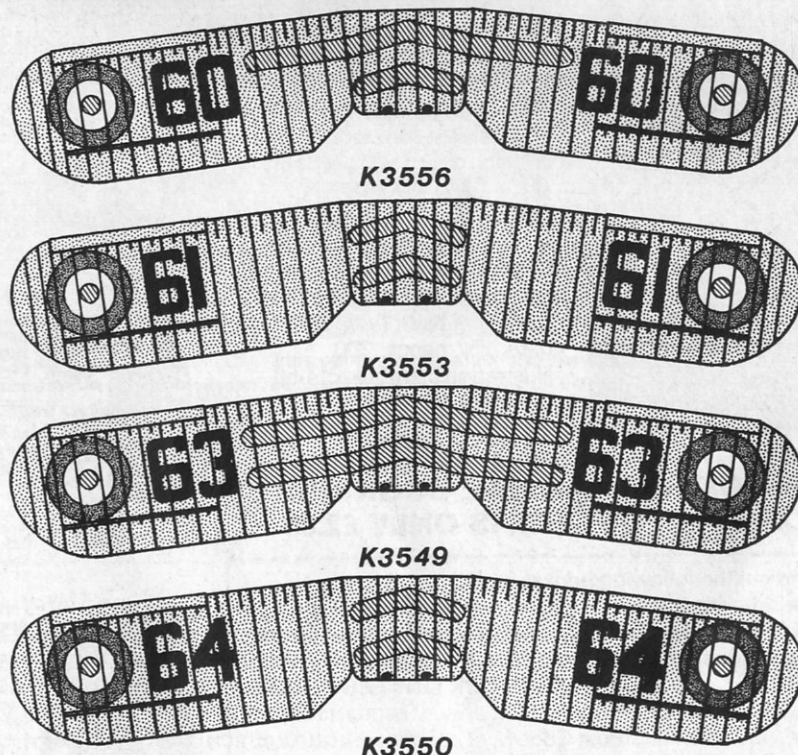
Torpedo-bomber Colours

Part 6: Renewal of the Baffin by Bruce Robertson

The Dart was replaced by the Ripon and that in turn was renewed by the Baffin. Renewed is perhaps the right word for although a few Baffins were built to replace Ripons, the majority were Ripon airframes renovated and re-engined with Bristol Pegasus radial engines.

A radial engine, with its air-cooling, offered advantages in weight over the heavy water-cooling of the Ripon's cowled Napier Lion engine and gave a marginally better performance. The first prototype with an Armstrong Siddeley Tiger I engine, and the second with a Bristol Pegasus, were built as private ventures for comparative engine trials and bore the provisional registrations B-4 and B-5. The first flew in September 1932 initially in red lead undercoat doping and was later given the standard overall powdered aluminium doping with black registration. Both civil prototypes and service production Baffins had red fuselage top decking and undersurface, common to torpedo-dropping aircraft of the period.

Production Baffins delivered 1933-34 had rudder striping that was eliminated in service from August 1934. The associated reduction in roundel size to prevent painting overlapping on to control surfaces did not affect production Baffins, as the Blackburn Company had already marked the wing roundels small.



Baffins in 812 Sqn affected an unusual individual identification markings by red chevron markings in addition to their fleet numbers displayed in black. Four representative variations are depicted here by Peter G. Cooksley.

DRAWN BY PETER G. COOKSLEY.

Baffins served in Nos 810, 811 and 812 Squadrons on HMS *Courageous*, *Furious* and *Glorious* respectively, with fleet numbers on a fuselage band of the respective carrier colour of light blue, red and yellow. For a short period 812 Sqn operated from HMS *Eagle* whose Fairey IIIFs had black bands, but the yellow bands of the Baffins were not changed.

Fleet numbers remained unchanged for torpedo-bombers operating from carriers with the Mediterranean Fleet, but with the Home Fleet, from 1935, torpedo bombers were allotted 3-digit codes in the 500 and 600 series.

There was a heavy toll of Baffins in crash landings and ditchings. The most sensational loss was that of S1562 (illustrated). At the end of a training torpedo run from Gosport on June 22 1936, the aircraft banked unsuccessfully to avoid the giant French liner *Normandie*, and hit the ship's foredeck. The pilot, Lt G. K. Horsey, RN, was unhurt. An exceptional loss was when nine Baffins (S1569, K2884-7, K3559, K3590, K4776, K4778) were wrecked in a gale at Hal Far, Malta, November 24 1936. Two more were lost in landing accidents at Alexandria the following February and the Baffin was withdrawn from service that year.

While the Baffin was withdrawn from Fleet service, it began service with the Royal New Zealand Air Force in 1938 as equipment for Territorial Air Force Squadrons. Of the 29 supplied, eight were used from 1939 as instructional airframes and the 18 still flying in 1941 were scrapped that year. No Baffin has survived.

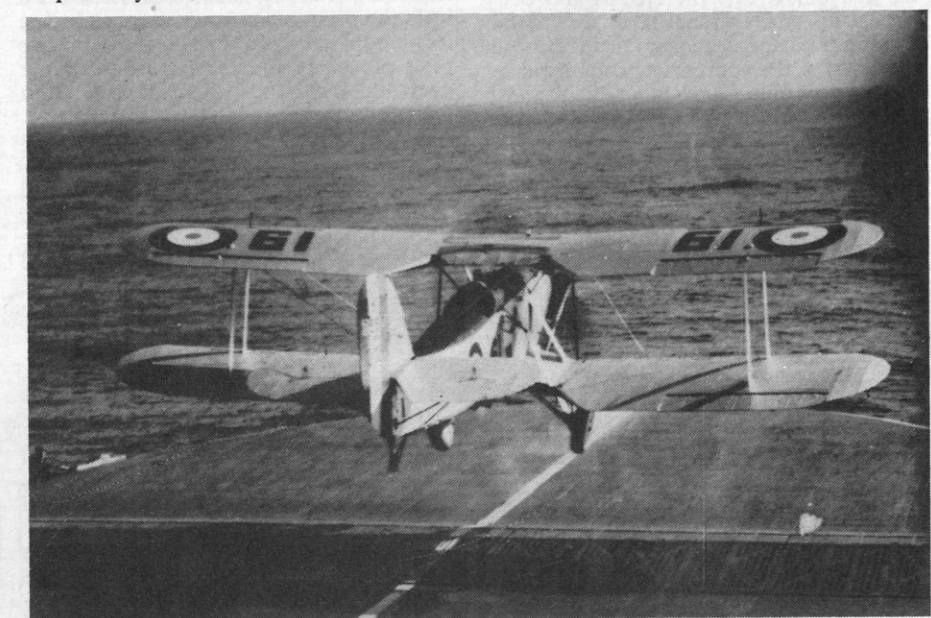
Ripons of No 812 Sqn, detached from HMS *Glorious*, just prior to their recall from the Mediterranean fleet for conversion to Baffins and reallocation to units. S1656 in the foreground bears the fleet number 74 in a deep yellow band. On the left, S1431 the torpedo bombing leader has red wingtips and red fins. (Peter G. Cooksley).

Baffin Versions

Firm's No	Quan	Markings	Type and Engine	Remarks
T5F	—	—	AS Jaguar Major	Ripon II project
T5G	—	—	Various considered	Long range bomber project
T5H	—	—	AS Tiger I	Ripon V project
T5J	1	B-4	AS Tiger I	Ripon V prototype
T5J	1	B-5	Pegasus 1M3	Ripon V 2nd prototype
T8	38	S-serials*	Pegasus 1M3	Ripon IIAs converted
T8	26	S1649-1674	Pegasus 1M3	Ripon IICs converted
T8	4	K2884-2887	Pegasus 1M3	Ripon IICs converted
T8	14	K3546-3559	Pegasus 1M3	Baffin production
T8	2	K3589-3590	Pegasus 1M3	Baffin production
T8	10	K4071-4080	Pegasus 1M3	Baffin production
T8A	3	K4776-4778	Pegasus 11M3	Baffin final production

*Ripon IIAs converted to Baffin: S1266, 1269, 1358, 1359, 1364, 1366, 1368, 1425-8, 1430-2, 1470, 1473, 1553-74.

29 transfers to RNZAF were re-numbered NZ150-178 being respectively ex-S1266, S1426, S1430, S1558, S1570, S1573, S1654, S1655, S1657, S1672, S1674, S1561, S1563, S1670, S1358, S1364, S1368, S1425, S1431, S1553, S1554, S1571, S1649, S1650, S1653, D3558, K4071, K4078, K4777. Of these NZ159, 166, 168, 172, 175, 156, 153, 150 became respectively instructional airframes INST4, 5, 6, 7, 16, 19, 22, 29.



Baffin of No 812 Sqn, seen on take-off, shows that Baffin markings followed those of the earlier Ripons. Fleet numbers were also marked on bottom wing under-surfaces. (MoD H827).



Baffins of the Torpedo Training Flight, Gosport, seen after the 1934 abolition of rudder stripes, front to rear, S1269 '1', S1672 '2' and S1562 '8'. Individual numbers were displayed in black on fuselage sides and on top wing upper-surface centre-section. Serial numbers appeared under the wings of these RAF Station Gosport training aircraft, but this did not apply to squadron Baffins held at the station for embarking on carriers.

New Models

Burago: Alfa Romeo 2300, 1:18 scale, UK £11.65

This is not a kit. It is a magnificent ready made model which sets extremely high standards, rather like the best made kits, and it looks good enough to get in and drive away. Essentially it is a giant version of a die-cast model car, the chassis and body being in conventional die-cast metal. Wheels, radiator, seats, and fittings, are all in plastic of the appropriate colour, plated where applicable. The bonnet lifts to reveal a detailed engine and the front wheels steer from the steering wheel. All the controls are there and the whole model is of display quality. If you already make and collect large scale cars of the 1:24/1:25 scale type, then this model will line up with them on the shelf though it is to a rather larger scale. It goes perfectly with kit-built cars of around 1:20 scale. The only modest improvements the modeller might make is to pick out the securing straps on the boot with a leather colour and paint the screen wiper blades and other small items in black. The model comes secured to a base in a substantial box with transparent front which makes quite a nice display case as it comes. The model is the latest in a range by the Italian firm Burago, distributed in Great Britain by Einco. Specifically this model depicts the Alfa-Romeo 2300 Spider of 1932. *C.E.*

Heller: Renault RE/20/23, 1:12 scale, UK £10.88 + VAT

The Renault, when it first appeared on the World's tracks marked a significant new era in Formula 1 motor racing with its V6 1.5 turbo charged engine. Renault won their first Grand Prix in 1979 with Jabouille at the wheel of his RS11. The RE20 got off to a great start to the 1980 season by winning in Brazil — the RE20's second race. The car managed to win two more Grand Prix that year and now Renault are now hoping for an even more fruitful 1982 with the RE30 favourite to win this year's World Championship.

Heller have re-created this spectacular car with great precision and thought. It is on absolute dream to build with no real problem facing the model maker. The modelling instructions are very helpful, if a bit simplified, but do not create a problem to interpret. For an accurate reconstruction of the car, painting is necessary as the various yellow plastics do not match and the white markings on the original are not on the model. One small problem with construction of the vehicle was that the cockpit and nose cowling would not fit easily together.

Beware the decals—they are very delicate and it is far too easy to tear them apart and

spoil the effect of an accurate reproduction. As we have said, this model is authentic but rather simple in design and nowhere better to show this than in the engine and turbo chargers which are very much lacking in detail. Apart from these slight gripes, the model is a real winner as a model and as a monument to a new era in the history of motor racing. *A.G.*

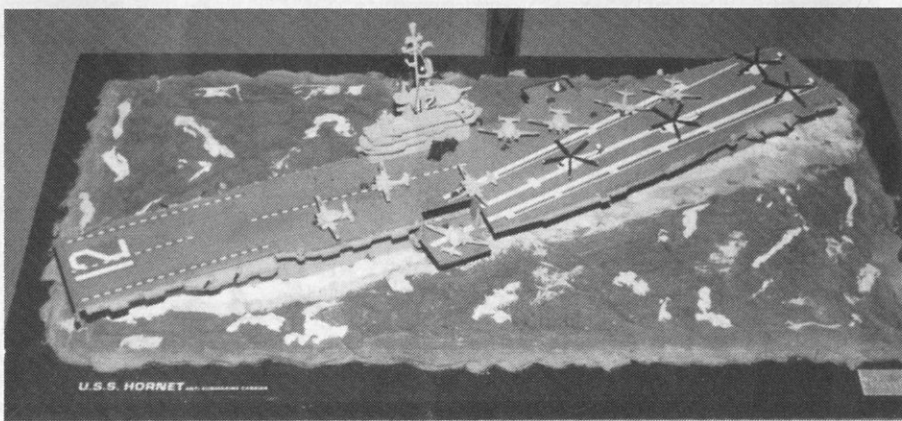
Plasticart: Su-7 Fitter, 1:72 scale, UK £1.85

Soviet aircraft are still thin on the ground, so this kit of the hardy old Su-7 will appeal to all those who like modern combat jets or Russian aircraft. It comes from the East German firm of Plasticart and is not entirely new, though it is new to us and only recently became available from the UK distributors Scale Model Distributors, Scan Buildings, Oldbury Road, Cwmbran, Gwent NP44 3JU.

The kit is fairly basic, though better than some. It has rather the look of the early 1960s about it, with some fairly crude engraving of access hatches. As these are a little too prominent, however, they look a lot better if lightly rubbed down. Items like pitot tubes and cannon barrels are rather heavy looking, but there is a cockpit interior and separate pilot figure in this one. Assembly is straightforward and the model is certainly fairly accurate enough in outline, at least when compared to published drawings and silhouettes. No very precise marking details are given, but there are three sets of markings, Soviet, Czech, and Polish, and this is overall a pleasing model. Send a SAE to SMD for dealer details if you can find no local stockist. *C.E.*

Revell: USS 'Hornet', 1:500 scale, UK £5.25

Here is a re-release of an old Revell favourite. Despite being quite an old kit, anyone collecting 1:500 scale warships will welcome the opportunity to get it again. The *Hornet* was a World War 2 'Essex' class carrier, but the Revell model portrays it as rebuilt in the 1960s period where it acquired a 'storm' bow, angled deck, revised island, and a complement of Trackers, Tracers, and AS helicopters when it changed role from attack carrier to anti-submarine carrier. Apart from one or two 'heavy' details on the surface in the old 1960s manner, this is a very good kit which goes together well. It is full hull but could be cut down to waterline with patient sawing. The two deck edge elevators slide up and down and the forward elevator may be set up or down. For its age, it is a good model which will not displease warship enthusiasts. *C.E.*



Airframe: Miles M39/Blackburn Airedale, 1:72 scale, prices in text
Airframe, from Burnaby Hobbies, 5209 Rumble Street, Burnaby, BC. Canada V5J 2B1 have added some further unusual types to their 1:72 scale range of vac-forms. First, at \$C3.00, plus 15% postage, is the Miles M39B Libellula of 1943. Very little known, it was, in fact, a small size replica of a proposed medium bomber design of unusual configuration. Having two Gipsy Major engines, it is quite a diminutive but sleek aircraft, with tricycle undercarriage, but the project was dropped and led to no further development. Second model is the Blackburn Airedale, a big three-seat fleet recon aircraft of which two prototypes were built. It is an interesting high wing monoplane with slab-like fuselage and wide chord wing. As its performance was no great advance on previous types it was never put into production. The simplicity and larger size of this aircraft should make it a good one for anyone wishing to try a vac-form for the first time, and anyone collecting Fleet Air Arm types will find this on worth thinking about. It costs \$3.25 plus 15% postage. *C.E.*

Esci: Mercedes-Benz 230G Rally, 1:24 scale, UK £3.95

We reviewed the original versions of Esci's Mercedes 230G field car in the March 1982 issue, and now we have essentially the same set of mouldings as a rally version as used in the Paris-Dakar Rally of 1981. Added to the kit is a sprue of parts with a stone guard, spotlights, etc. and a set of colourful sponsor transfers. Checked against pictures of the real thing provided on the instruction sheet, the model appears to be very accurate. As the body is moulded in white and the decals are very complete, this model can be completed with the minimum of painting. As with all Esci kits, this one is sharply moulded and parts fit well. *C.E.*

Revell: Veteran cars, 1:28 scale, UK £2.60 each

This is a very happy range of famous veteran car kits, nicely boxed and presented and pleasing to make and run. Run? Yes, they have compact friction drive motors which fit quite neatly under the chassis and do not show much except from low angles.

These give a rather gentle run of a few feet, and the car's brake handle acts as a release lever. We were amused to see that in the case of the Renault we made up, the drive imported a very realistic judder which in turn caused the mudguards to wobble realistically in true veteran car fashion. The kits come ready-coloured though it is possible to pick out extra details in other colours. Brass plating is provided where required. Assembly is very easy and a quite

MODELDECAL DECALS 1/72 SCALE

1. BAC Lightnings in RAF service. Mk. 1A 56 Sqn. 'Firebirds', Mk. 2 19 Sqn., Mk. 2 92 Sqn., Mk. 6 23 Sqn., Mk. 6 5 Sqn., Mk. 6 74 Sqn. All a/c have bare metal finish.
2. F-4 Phantoms. VMFA-521 USMC, 497 TFS USAF, 76th Sqn. Royal Navy.
3. F-100D Super Sabres: Triple Zilch!, 20th TFW, 1960. 'Pahokee Tiger', 307th TFS, 1965. 416th TFS, 3rd TFW, 1966. 309th TFS, 31st TFW, 1968. All four being USAF aircraft.
9. A-1J Skyraider, VA-176 USS Intrepid, U.S. Navy 1966. A-7E Corsair, VA-195 USS Kittyhawk, USN 1970. SH-3A Sea King, HS-3 USS Randolph USN 1967.
10. RF-101C Voodoo 45th TRS, 1969. F-105D Thunderchief, 357th TFS, 1970. A-1H Skyraider, 6th Spec. Ops. Sq., 1969. EC-47N Dakota, 360th TEWS, 1969. All aircraft camouflaged.
13. T-33A WSLW50 Luftwaffe 1968. Fiat G-91R/3 LeKG 43 Luftwaffe 1969. F-104G Starfighter MFG, 1970.
14. Sabre F.1, 234 Sqn. 2 TAF RAF circa 1954. Vampire F.B.5, 12 Sqn. 2 TAF RAF circa 1951. Chipmunk T.10, 2 FTS RAF 1971.
15. A-7E Corsair, VA-113 'Stingers', USS Ranger, USN 1970. AV-8A Harrier, VMA-513 USMC 1971-2. F-4B Phantom, VF-111 N.A.S. Miramar, USN 1971.
17. T-33 4 Wing RCAF, Germany 1967. F-35 Draken, 725 Sqn. R. Danish A/F. 1971. Mosquito F.B.6, 4 Sqn. RAF 1949. A-4G Skyhawk, 805 Sqn. R.A. Navy 1969.
18. Gannet Mk.4 (COD), Ark Royal, RN 1965. Sea Hawk F.1, 898 Sqn. FAA 1954. Wessex Mk. 1, S.A.R. Flight, Ark Royal 1970. Avenger Mk.6, 831 Sqn. FAA 1958.
21. A-4E Skyhawk, VMA-311 USMC, 1968. A-4E Skyhawk, VA-94 USN, 1970. A-4F Skyhawk VA-164 USN, 1969. AD-4 Skyraider VA-65 USN, 1954.
22. A-7D Corsairs of 356 TFS, 354 TFW and 40 TFS 'Satans', 355 TFW USAF, 1972. T-33A, 50th TFW, USAF, 1962. F-86A, 116 FIS USAF, 1951.
23. Phantom FG.1, 43 Sqn., 1972. Harrier GR.1A, 3 Sqn., 1973. Lightning F.2A, 92 Sqn., 1973. all RAF. CF-104 Starfighter, 421 Sqn., CAF, 1973.
24. Phantom FGR.2, 41 Sqn. RAF, 1972. Hunter F.6, 79 Sqn. RAF, 1972. Sea Venom FAW.21's of 801 and 890 Sqn. FAA, Wyvern 54, 831 Sqn. FAA.
25. All RAF. Lightning F.2A, 19 Sqn., 1974. Canberra B(I)8 16 Sqn., 1972. Harvard T.2B. 500 Sqn., 1952. Hunter FGA.9, 45 Sqn., 1974.
26. Buccaneer S2B, 15 Sqn. RAF, 1974. Hunter FGA.9 58 Sqn. RAF, 1974. Canberra B2, 10 Sqn. RAF, 1956, plus RN and RAF Gazelles.
27. Canberra T4, 231 OCU, RAF, Cottesmore 1974. Hunter T7, 4 FTS, RAF 1973 (or 56 Sqn. 1962). Phantom FGR.2 111 Sqn. RAF Coningsby, 1974. Buccaneer S2A, 208 Sqn. RAF, Honington, 1974.
29. BAC-SEP Jaguar GR.1, 14 Sqn. RAF, 1975. BAC-SEP Jaguar T.2, 14 Sqn. RAF, 1975. Rep. F-84F Thunderstreak, 314 Sqn. Dutch A/F Rep. RF-84F Thunderflash, 717 Sqn. Norwegian A/F, L.C-130H, Hercules, 721 Sqn. Danish A/F.
30. US-2N Tracker, 320 Sqn. Dutch NAS, Javelin FAW. 8, can be finished for either 41 Sqn. or 85 Sqn. RAF 1963. Jaguar GR.1, 17 Sqn. RAF, 1975. Jaguar T.2, 17 Sqn. RAF, 1975. Phantom FGR.2, 29 Sqn. RAF, 1975.
31. H. Fury 1, K5673, 1 Sqn. RAF, Tangmere, 1937. B. Bulldog IIA, K2151, 23 Sqn. RAF Kenley, 1932. G. Gladiator I, K8027, 87 Sqn. RAF, Debden, 1938. A.W. Siskin IIA, J8959, 43 Sqn. RAF, Tangmere, 1930.
33. British a/c post-war serial letters (black), 16 in, 18 in, 20 in, and 24 in heights. Examples of types using these sizes: Sabre, Jaguar, Hunter, Lightning, Vampire.
34. British a/c post-war serial letters (black), 30 in, 36 in, 48 in heights. Examples of types using these sizes: Gannet, Mosquito, Phantom, Phantom FG.1.
35. British a/c post-war serial numerals (black), To be used with Sets 33 and 34.
36. British a/c post-war fuselage serial letters and numerals (black), 8 in height, variations in design included to cover various styles. Also includes a few 4 in 'Royal Navy' plus 8 in and 12 in dittos, and 'Royal Air Force'.
37. Phantom FGR.2, 56 Sqn. RAF, 1976, with optional markings for 2 Sqn. RAF, 1971. Sabre F.1, 20 Sqn. 2nd TAF, RAF, 1955. Mirage 111E.E.C.2/4, L'Armee de l'Air 1976. CM170 Magister, L'Armee de l'Air, with optional markings included. F-111E, 20th TFW, USAF Upper Heyford, 1976, as at Greenham Common display.
38. Provost T1, 1 FTS, XF559 as Sept '59 and April '60. F-84F Thunderstreak, 2nd F.B. wing, Belgian A/F, 1956. Mirage M5F, E.C. 3/13, L'Armee de l'Air 1973. S. A. Bulldog T1, London UAS and 2FTS RAF 1974. Vampire FB.9 Sqn. RAF, Jaguar GR.1, 2 Sqn. RAF, 1975.
39. WW2 British roundels and fin flashes, types A and A1. Type A diameters: 20, 35, 40, 42, 45 inches. Type A1 diameters: 20, 28, 30, 34, 35, 42, 45.5 inches. Fin flash widths: 15, 18, 21 inches.
40. WW2 British roundels and fin flashes, types A, A1, C and C1. Type A diameters: 45, 50 inches. Type A1 diameters: 49, 56 inches. Type C diameters: 40, 63 inches. Type C1 diameter: 54 inches. Type A fin flash widths: 9, 12, 24, 27, 36 inches. Type C width: 54 inches.
43. F-4EJ Phantom, 302 Sqn. Jap. ASDF plus emblems and serials for 301 Sqn. alternative, Jaguar GR.1, 41 Sqn. RAF, 1977. Jag T.1, 19 Sqn. RAF, 1977. F-7F/F-104G Starfighter, Dutch Air Force, choice from either 306 Sqn, 311 Sqn, 312 Sqn, VlbVKL, or 'Dutch Masters', F-84F Thunderstreak, E.C. 1/9 L'Armee de l'Air, 1961.
44. F-104J/DJ Starfighter, Jap. ASDF, choice from either 202/3/4/5/6 Sqn. Phantom FG.1, 892 Sqn. FAA, 1977, either XV567 '002' or XV568 '003' can be modelled both with 'Silver Jubilee' markings, W. Lynx, Dutch Naval Air Service, 1977, AD4-N Skyraider, choice from Esc. 1/20, Esc 1/21, Esc. 2/28, L'Armee de l'Air.
45. Greenham Common 1977 (1). Lightning F3 XP764 or XR720, or F6 XR754, all 11 Sqn. RAF, Mirage F1C, E.C. 1/12 L'Armee de l'Air, F-5A(G) 336 Sqn. 'Jokers', R. Norwegian A/F, four alternatives. Sea King HAS 50, 817 Sqn. Royal Australian Navy. Hawk T1 XX164 or XX165. C.F.S. RAF.

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professional looking model results. The design is well thought out and the models are all accurate and realistic despite being aimed at a junior market level as far as construction and features go. They do not look too out of place with 1:32 scale models (unless of course you compare like with like), and the 1:28 scale goes exactly with the same firm's well-known range of World War I aircraft. Aside from the 1911 Renault, the range comprises 1911 Model T, 1907 Stanley Steamer, and 1909 Opel Doktorwagen. They would make fine gifts for younger modellers, but anyone looking for fun models which are worth collecting in their own right will enjoy making these. C.E.

Burago: Mercury Capri RS, 1:24 scale, UK £4.95

Another ready-made die-cast model, this one will go with similar car models to this scale made from plastic kits. The model is to a very high standard of finish, detailed

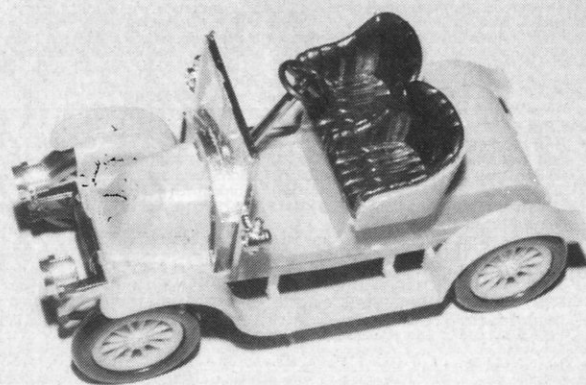
inside and out, with opening doors, opening hood and tailgate, tipping seats, and steering front wheels from the steering wheel. The Mercury Capri RS is a performance version of an up-market American car made by Ford. Finish is excellent throughout and the turbo engine is well depicted. In this model there is actually a fair amount of plastic, including the chassis pan and the interior. There is quite a range of car models in this scale by Burago — over 50 are listed. C.E.

Burago: Zackspeed Ford Capri, 1:24 scale, UK £3.95

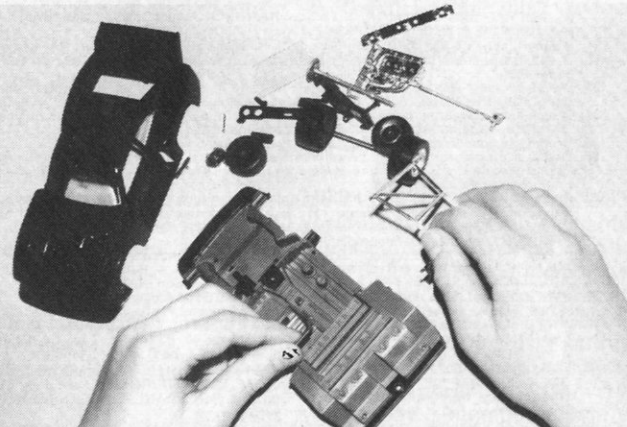
In addition to the range of ready-made die-cast cars in 1:24 scale by Burago, they also offer a number of similar cars in assembly kit form. Latest of these is the Zackspeed competition version of the Ford Capri, though 12 others are available. When completed these models match the ready-made versions but do not exactly duplicate any of them — though some are

alternative versions. This Capri comes as an impressive kit. As it is really a ready-made model in 'knocked-down' form it is not difficult to assemble so long as you read the instructions diligently and get the order right. Being made for factory production, this is one of those models where, for example, if you forget to position the steering column at a certain stage you don't get access to its location again. Also there are a couple of occasions, like fitting the steering linkage and the doors, where you really need two hands. Obviously in the Burago factory they would have jigs available to hold the model for these stages of assembly. The body and all parts come pre-coloured and there is a large decal sheet giving all the colourful Zackspeed decorations. It takes longer to apply these than it does to assemble the model, but the finished result looks good. If you make 1:24 scale plastic cars you'll find this kit worth a glance. C.E.

C.E. Chris Ellis; A.G. Alastair Goodale.



The Revell model of the Renault 1911 car.



The Burago Capri about to be assembled.

New Books

Operation Chastise by John Sweetman. Jane's Publishing Co Ltd, 238 City Road, London EC1V 2PU. £9.95.

If there is anyone who has never seen the film of the Dam Busters or read the book, now is your chance to find out about that celebrated raid. If you have seen the film you may be labouring under an apprehension. Contrary to popular belief, Barnes Wallis was not completely responsible for the creation of the bouncing bomb, which he, in fact, is the first to admit. He relied on a variety of organisations to provide him with suitable information and it was the Ministry who set up the resultant publicity following the raids where Wallis is claimed as the only inventor. Was the entire Operation a complete success or was it a waste of men and materials? This book attempts to give some of the answers by

interviewing Sir Barnes Wallis, and other officers and surviving aircrew so it should prove of interest to those who like to try and get at the real facts.

The Evolution of Weapons and Warfare, by Colonel T. N. Dupuy. Jane's Publishing Co Ltd, 238 City Road, London EC1V 2PU. £8.95.

Starting with the pike, bow and sword and ending with guided missiles Col. Dupuy gives us a guided tour of weaponry down the ages. The most important aspect of this book, however, is the analysis of war and use of weapons on land, sea and air. If you are interested in gaining an overall view of how weapons have advanced you might find this of interest but otherwise it makes rather dull and unexciting reading.

Armies of the Carthaginian Wars 265-146 BC, by Terence Wise and Richard Hook. Osprey Publishing Ltd, 12-14 Long Acre, London WC2E 9LP. £3.50.

Part of the Men-at-Arms series, these books are very good value as they present a mixture of photographs, text and lively illustrations on archaeological remains, and modern sights as they can be seen today. The text, although fairly simplistic in approach, is of a general nature but informative. Illustrations are sometimes a little comical in as much as the pages are stalked by grinning leering, evil eyed Celts and Romans but they do help to bring the people alive. Recent publications in the same series are: **Napoleon's German Allies** (5) by Hessen-Darmstadt and Hessen-Kassel, **The Australian Army at War**

1899-1975 by John Laffin and Mike Chapell and the **German Commanders of World War II**. They are the same prices as above and can be obtained from Osprey Publishing.

The Underwater War 1939-1945 by Richard Compton-Hall. Blandford Press, Link House, West Street, Dorset. £8.95.

Looking at a submarine's cramped quarters it is difficult to imagine how anyone could be persuaded to work in them for any period of time. Yet the crew of submarines were a fiercely loyal, courageous band of men who helped the war effort of 1939-1945 immeasurably. This book is a look at the men in action both in the attacking role and under attack. The photographs are excellent, the text informative and lively.

Modern Soviet Air Force, by Bill Gunston. Salamander Books Ltd, Salamander House, 27 Old Gloucester Street, London WC1N 3AF. £3.95.

Bill Gunston is a well known and respected writer in the field of Avionics. You can be sure that his books are as accurate as possible and this one is no exception. Part of the Illustrated Guides Series, all the information has been compiled at the beginning of this year, so that it is as up to date as possible. Listed alphabetically in order of their design bureaux, there are roughly forty aircraft illustrated and described. Most are old favourites such as The Ilyushin, the Tupolev and the Yakovlev Yak and there is also a small section on air-launched missiles. A useful book for a quick reference.

Post Box

Letters and photographs from readers selected for publication will entitle the sender to receive a free kit of his choice from Airfix Series 1, 2, or 3 (subject to availability).

Battlecruisers

I was very interested by M. W. Williams' first article on British Battlecruisers in the May issue.

However, I believe the illustration at the top of page 439 to be a ship of the 'Invincible' class and not of *Indefatigable* as stated in the caption. The 'Invincible' class were built with funnels of equal height. In 1910 the fore funnels of *Inflexible* and *Indomitable* were raised to keep the bridge free of smoke. 'Invincible' was not so modified, and I have in my possession a photograph of this ship in action at the Battle of the Falklands on 8 December 1914 in which the equal height of the funnels is very clearly visible. Also the assertion in the caption on page 439 that the bow view has foreshortened the aft superstructure cannot be true since the aft funnel can be clearly seen to be sited between the forward placed legs of the mainmast tripod which were a feature of the 'Invincibles'. With regard to the completion dates five in the tables on page 440 it should be noted the 'Invincible' class were all completed by the late Summer of 1908. It should also be made clear that the dates given against the silhouettes refers to the appearance of the ships at that time.

I trust this will clear up these points for those readers who might otherwise be misled.

Readers may also like to see the photograph of my model Sea Fury — the later FB11 in 1:72 scale. The kits used were Frog's Sea Fury, Matchbox's Tempest II plus a lot of scratch-building. We do not seem to see much about this aircraft in the model press these days probably due to the lack of decent kits, but it can be done with a little hard work.

L. Cousins, London E10

Do you know?

I have recently acquired some Feeisler Storch kits, both the Heller and the now rare Airfix varieties. Being 'ground' rather than 'air' myself, I am turning to you or your readers for a little guidance.

Could you advise me whether either or both of these kits can be used from the box in order to model those Storchs used by elements of Grossdeutschland Division in the van of the German advances on Holland and France in 1940? If not, could you direct me to a source that might indicate the required conversion?

The only reference that I can find to a five-seater variant was an abortive civilian project, which, as it was undertaken by Morane Saulnier, I assume to have commenced after the fall of France.

M. D. Taylor, London SE13

The Airfix kit represents the Luftwaffe type of the 1940s but we believe the Heller kit includes options for the post-war French production type. Editor.

Suggestions

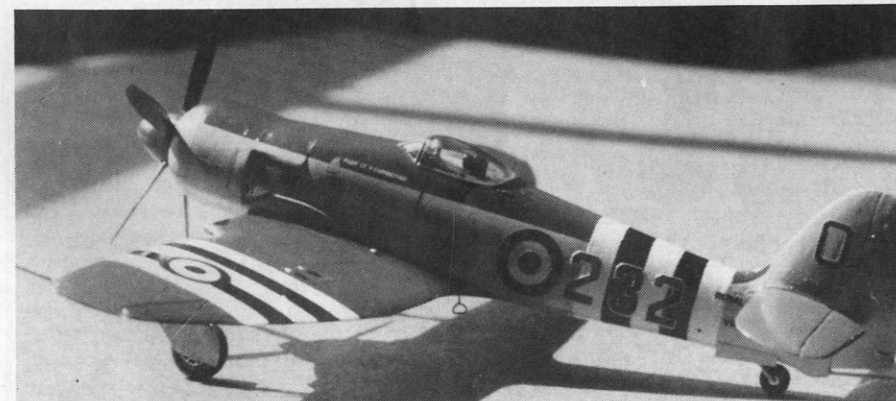
Having seen on sale kits of both the original DH Mosquito VI EG-T (MM417) together with Airfix's latest offering, I chanced to check the code of the older kit. This represents an aircraft of 487 Squadron which with 464 Squadron mounted the famous raid on Amiens prison in February 1944. Surprisingly no reference was made to this on the instruction sheet.

Rather than have decals representing a practically unused Australian Mosquito, would it not be more satisfactory to resurrect the decals relevant to the more historical aircraft in the recent kit. For the Amiens raid, the aircraft carried 4 x 500 lb bombs and perhaps these could also be included in the new kit additional to rockets. If not, why not market a kit which can be made up either into a Mk IX or a Mk XXX fighter?

The kit includes both drop tanks and the necessary bomb as an alternative. Since both the Mk IV and Mk XXX usually carried the former (and to make both aircraft, two kits would be necessary anyway) the spare bomb carriers could be used for the Airfix Mk VI. However I confess I do not know what the codes/serial No of Group Captain Pickard's particular aircraft was but that information can be obtained from books on the subject.

Perhaps Airfix could produce a set of boxed 'operating' aircrew in different postures to make their aircraft more interesting plus bombs of different sizes; some decent machine guns to replace those on earlier products would be a good idea too, as those on the early Mosquito are shockers.

S. Close, Gravesend, Kent



Reply

Your correspondent Mr R. J. Bezzant expresses surprise in the March issue, that the 17 pdr anti-tank gun might be manned by Welsh Guards or indeed by implication any other infantry. I do not have the February 81 issue so cannot tell from his letter whether the photograph referred to, is of wartime or post origin. If the latter, he need not be surprised about its manning. Whilst the 17 pdr during the War was mainly issued to AT Rgts RA (apart from its tank and Naval forms), after the War sense prevailed and the infantry lost from its SP Coy, the then out-dated 6 pdr and received 17 pdrs instead. The 17 pdr was even in some ways preferred by the infantry to its successor the BAT as both were heavy and numb but the BAT had a sheet of flame out of both ends! Only when the BAT realistically lost its shield and became MO and WOM did its undeniably superior penetrative performance outweigh its other disadvantages.

I last saw the 17 pdr fired in 1964 but it lasted in some TA battalions in the AT pln until the TA reorganisation in 1967. We towed ours with White half-tracks and they did it well but these were very tired and were replaced in 1961 by Austin K9 4 x 4 1 ton trucks to the detriment of any off-road deployment.

A. Wilson, Beverley, Yorkshire

Appeal

As a modeller, my interest is mainly involved with British armoured cars, and presently the cars of the RAF. However, other than a few copies of a series published back in 1972, and a few other bits and pieces, I know very little in fact, next to nothing about the RAF Armoured Car Companies, and the details of the various types of cars, such as colour schemes, markings and histories of these units. As far as I know, there has never been a book specially about RAF Armoured Cars. Due to this almost complete lack of information, I would like to make a sort of appeal. I am interested in contacting anyone who has any information on the RAF Armoured Car Companies, such as I listed before. As this information is for various modelling projects, I would gratefully appreciate any help.

Kerry Brunner, 7343 N. Teutonia, 16, Milwaukee, WI 53209, USA

Stars and Bars Society would like anyone interested in their activities to contact them. They are primarily a re-enactment society putting on mock battles for charities but also provide information to war gamers and modellers. Write to Mr B. Netteridge, 55 Prestop Drive, Westfields, Ashby de la Zouch, Leicestershire.

IPMS Tyneside are holding a 'Northern Model Expo' at the Recreation Centre in the Eldon Centre, in the heart of Newcastle on 17 July. Open 10.00-17.00. Competitions are open to members and non-members so everyone is welcome. For more details write to the: Hon Secretary, 9 Birkdale Close, Donwell Village, Washington, Tyne and Wear.

The Bournemouth Air Pageant is once again going to be presented to the public on 18 July at Ham airport. The Red Arrows and Falcons will be appearing, along with other aircraft demonstrations and ground displays. Don't miss it!



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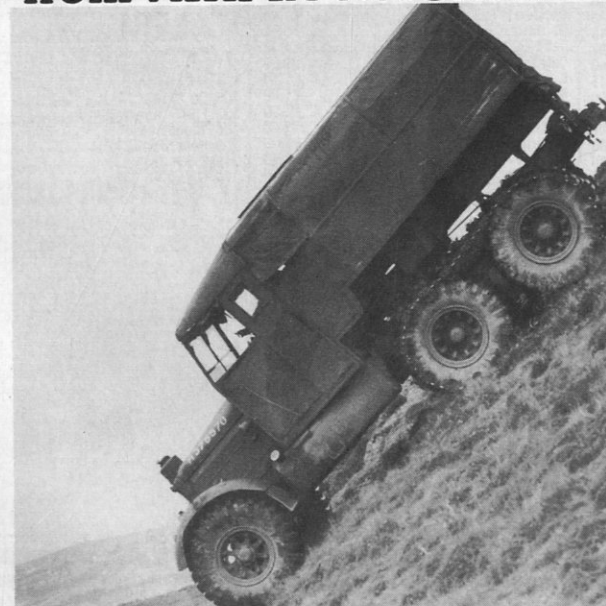
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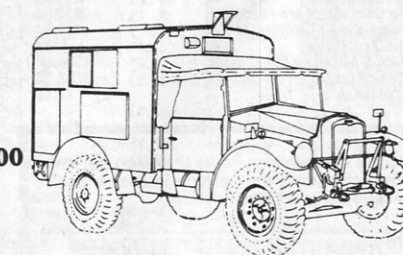
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